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January 24, 1949

STEEL

The Magazine of Metalworking and Metalproducing

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The WEAN ENGINEERING Company, Inc.
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SPECIALISTS IN SHEET, TIN & STRIP MILL EQUIPMENT

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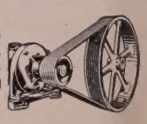
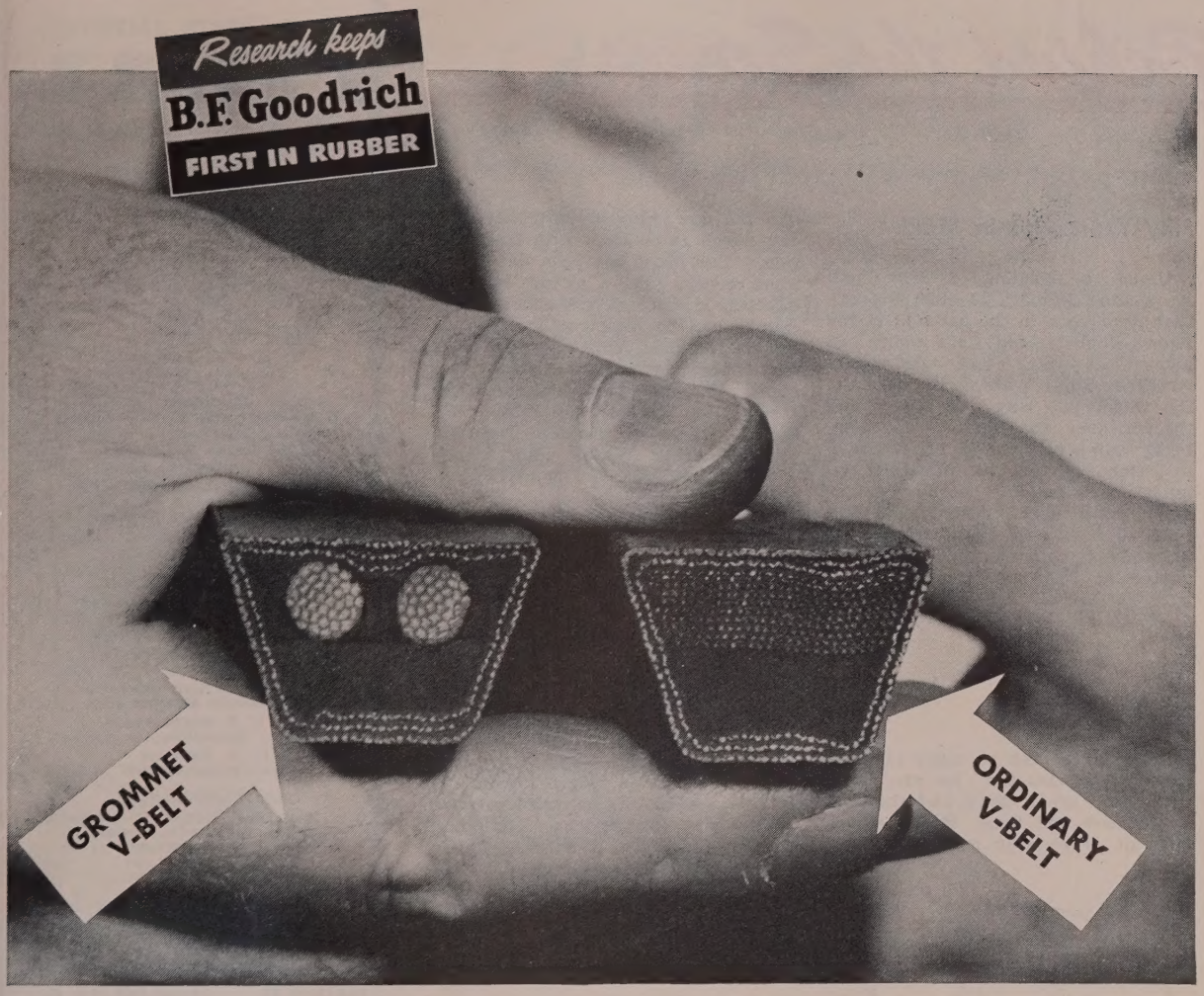


PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.



Cut V-belt costs 20 to 50% with new B. F. Goodrich grommet V-belt

Lasts longer, stands shock loads better, costs no more

A NEW patented construction by B. F. Goodrich puts all the cord material in a V-belt to work in the form of twin, endless, extra-flexible grommets — *not* cables — placed close to the driving faces of the belt (see left, above). No "lazy" cords in the interior to shirk their share of the load. Because grommets are endless they are more flexible, with no stiff section such as occurs in an ordinary cable, with spliced or overlapped ends.

Why twin grommet construction? When an ordinary large-sized V-belt (right, above) goes into the sheave its sides are squeezed by the pulley, forcing the center cords downward and out of the line of load-carrying stress. Belt men call this "dishing", because the cord section becomes concave, like a dish. With twin grommet construction there are no center cords, no "dishing" — as the belt goes into the pulley the grommets remain on the job, close to the driving surfaces of the belt.

Grommet belts take shock load better, last longer — Laboratory and field tests show that grommet belts have a higher safety factor, greater ability to withstand shock load, than ordinary V-belts. Reasons: no "lost" or "lazy" cords to shirk, greater flexibility, better gripping power. Grommet belts tested lasted from 20 to 50% longer than ordinary V-belts. Reasons: no cord overlaps (85% of ordinary V-belts fail in the overlapped section), no sawing cords, less heat.

How to get genuine grommet V-belts — Twin grommet construction is an exclusive, patented B. F. Goodrich development — no other manufacturer can make grommet V-belts. Now available in "D" and "E" sections. To be sure you get genuine grommet V-belts see your B. F. Goodrich distributor. *The B.F.Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

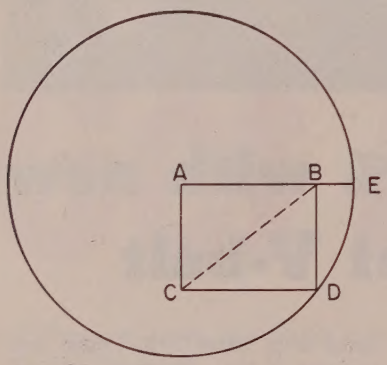
Behind the Scenes...

Fifty Years Ago In STEEL

Under the heading of "Fires and Accidents", January 26, 1899, we note that the engine in the bar mill at the Brown-Bonnell Iron Co.'s plant ran away last week and was badly wrecked. High water ran into the fly wheel pit, was caught up and thrown over the engine. The belt, being slippery, came off. Down in Pittsburgh, the Mackintosh-Hemphill Co. was building the largest universal mill ever constructed, with rolls 30 inches in diameter. On the price front, common mill scrap was quoted at $8.50 per gross ton, pig iron at $10.50 and steel plate at $1.40.

Puzzle Corner

There have been so many requests for new puzzles that we are going to have to break down and shove in a few here and there. Here's a nice difficult problem in geometry for a



starter. All you know is that BE is 2 inches, and the dotted line C^B is 11 inches. The problem is to discover the diameter of the circle.

Dezolved Without a Trace

We try to keep tabs on all the plants in the metalworking industry, via a flood of direct mail and a lot of field work. Queries about plants sometimes bring in queer answers, like the one from Indiana the other day which came back with the notation, "This plant has been dezolved". That creates quite a picture of annihilation, doesn't it? Businesses, of course, can be dissolved legally, but this is the first plant we have ever heard about which had that treatment. Wonder what solvent they used. And the spelling brings out the fact that no English word in common usage begins with "dez-", which we throw in as an extra fact, no charge.

On Not Handling Stuff

The Materials Handling show in Philadelphia this month contained a lot of interesting exhibits and the attendance reflected the importance of that subject in today's business atmosphere. One of the best concrete examples of how good materials handling is able to reduce work loads and pay off is in this week's issue, telling how Westinghouse eliminated the enormous total of 661,000 pounds of manual handling *per day* by revamping its foundry. Quite a tale, too, and one which makes interesting reading.

No More Dear

The campaign to eliminate "dear" from the salutations of business letters seems to be making some headway. Probably, like the revision of the calendar and the use of Esperanto, it would be a good thing if you could only get everybody to do it. Standard Rate & Data Service, the directory which tells you all about the circulation and audience among other things about newspapers, magazines, radio, etc., is now on the bandwagon. Their stationery suggests, "Let's drop 'DEAR' in Business Letters—and put the spirit of friendliness into the letter itself. Are you with us?" Instead of the conventional opening, they use a phrase, such as "We really appreciate, Mr. Blank . . ." which does seem like a sensible idea.

Shrdlu

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STEEL

Vol. 124—No. 4 January 24, 1949

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NEXT WEEK . . .

"Cool Grinding" of Surface Hardened Steel

Determining Small Amounts Of Carbon in Steel

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STEEL

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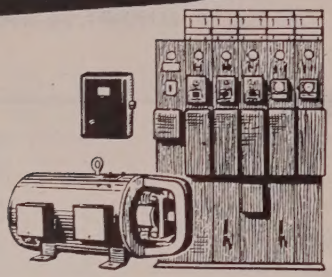
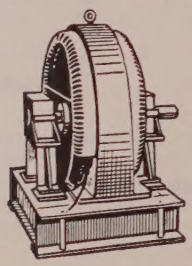


INDUSTRIAL-TRUCK BATTERY-CHARGERS

In 1910, The Electric Products Company introduced the first Automatic Battery Charger.

ASK FOR BULLETIN 203



SYNCHRONOUS MOTORS

From stator frame to rotor windings, E.P. Specialization is your guarantee of long life and trouble-free operation.

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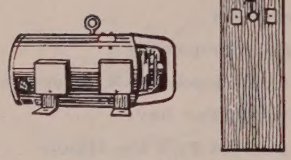

STANDBY BATTERY-CHARGERS

Diverter-Pole Motor-Generators assure maximum battery life, full-automatic operation and protect themselves against harmful overloads.

ASK FOR BULLETIN 207

also

INDUSTRIAL DYNAMOMETERS
SPECIAL MOTORS AND GENERATORS
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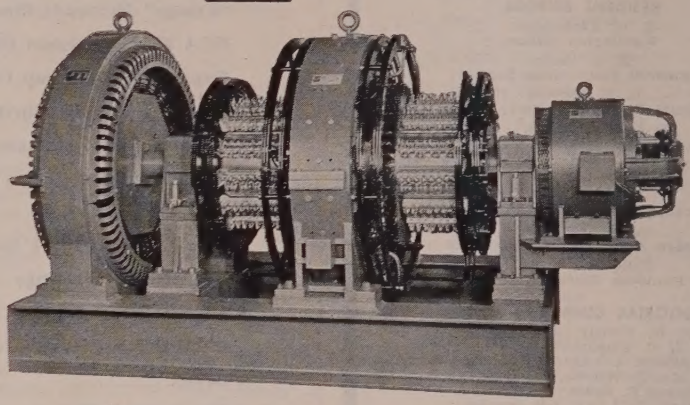
SYNCHRONOUS GENERATORS

SHOULD WE SAVE PENNIES... *or DOLLARS?*

. . . use an EP motor-generator



IT'S not the first cost that counts . . . it's the price of the equipment plus the cost of installation plus the expense of operation and maintenance. Lower life-time cost is the way to save DOLLARS. That's why the E.P. Motor-Generator has been selected to supply hundreds of thousands of direct-current amperes throughout the metal-working industry for electroplating, electrocleaning, electrotinning, electrogalvanizing, electropolishing and anodizing.

Designed specifically for electrolytic processes, the E.P. Motor-Generator reduces power bills because of its life-time efficiency of 75% or better; assures more amperes per dollar because it can safely handle heavy overloads; and requires no special protective equipment like expensive forced-draft ventilating or high-cost vaults.

Thirty-four years of operating experience prove that E.P. Motor-Generators give economies of operation unmatched by any other source of direct current.

EP X-52

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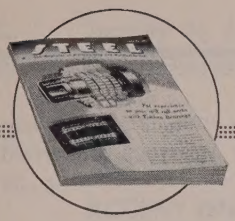

January 24, 1949

"Pork Barrel" Steel

In his "state of the union" message on Jan. 5, President Truman asked Congress "to authorize an immediate study of the adequacy of production facilities for materials in critically short supply, such as steel; and if found necessary, to authorize government loans for the expansion of production facilities to relieve such shortages, and to authorize the construction of such facilities directly if action by private industry fails to meet our needs."

This proposal startled the nation because it went farther than any previous President had gone in openly advocating the entrance of the government into the steel industry. However, persons familiar with the actual situation in steel supply and demand were not too much concerned because they were confident that an honest study would result in findings favorable to a continuation of steel expansion under private auspices. Also it was felt that Congress would be very cautious about committing the nation to the nationalization of steel.

That such complacency may be unwise is indicated by current developments. Rep. Wright Patman of Texas has used the President's proposal as a basis for suggesting a "Full Employment Bill of 1950" which would provide for $15 billion to be lent by Reconstruction Finance Corp. to public or private agencies for industrial expansion. Almost simultaneously came an application from Lone Star Steel Co. for $65 million from RFC to finance projected steelworks and tubular goods mills at Lone Star, Tex. Representative Patman says the Lone Star project is only one of six needed in the Texas area.

Thus in two short weeks, and before any study has been made, President Truman's proposal has been expanded into a full-fledged campaign having sinister pork-barrel implications.

As long ago as last September, former President Hoover told the National Press Club that while "we have not socialized industry, we have come close to socializing savings into the government." The savings of the people are drawn in increasing volume into the federal treasury through taxes. If this continues, he warned, "we will come to the point where the only source of capital will be the government."

To make RFC money readily available for pork-barrel industrial expansion is tantamount to openly inviting the socialization of steel.

* * *

WITH HATS IN HAND: Since early November cutbacks in some plants which use steel in sizable quantities have aroused hope among many steel consumers that the day when supply will match demand may be nearer. To numerous good customers of the mills, this hope is turning out to be a mirage.

One reason is that some mills are withdrawing from areas in which they have sought business aggressively for decades. It is not uncommon for a distant customer to be told that the mill no longer can serve him. When pressed for an explanation, the mill claims that under the present uncertainty as to future pricing methods, with freight rates higher than ever before and with a buyers' market approaching, it is good business for the mill to get into the good graces of important nearby prospective customers as soon as possible. In adjusting the mill's clientele to the new situation, it becomes necessary to sever relations with some valued customers of long standing. So sorry!

However sincere as this explanation may be, it leaves the "valued customer" cold. His "his-

(OVER)

torical purchasing record" with other suppliers probably is limited. He may be in an area where under present idiotic conditions, no mill wants his business.

To many customers this situation looks pretty serious. It is serious—right now. However, no supplier of anything, in his right mind and in a buyers' market, ever turned down business when he needed it. No matter what pricing system prevails, when the going gets tough the mills will be around to prospective customers—near and far—with hats in hand, begging for orders. —p. 26

* * *

NO TIME FOR LETDOWN: Discussion at the 21st annual meeting of the Institute of Scrap Iron & Steel at Cincinnati last week reflected the unusual situation which exists in the scrap market today. While more scrap was collected in 1948 than in any year in history, supplies today are more plentiful than at any time since before the war, buyers are out of the market and prices are softer than at any time in two years, the prospect of producing 92 million tons of ingots in 1949 calls for a continued effort to get out every ton of scrap that can be obtained from any source.

In short, it would be a calamity if the present easier situation in supply should lead to a pronounced or extended letdown in the collection of scrap. —p. 30

* * *

MORE FOR YOUR MONEY: Announcement of the 1949 Chevrolet at the colorful extravaganza at the Waldorf in New York last week brings to mind an effective exhibit which General Motors arranged in Washington a few weeks ago to dramatize the testimony of executive vice president M. E. Coyle before the Joint Committee on the Economic Report.

The exhibit consisted of a 1929 Buick and a 1948 Chevrolet. The manufacturer's list price was $1280 for the Chevrolet and $1320 for the Buick. But for the $1280 in 1948 the buyer received greater horsepower; higher maximum speed; much greater fuel economy; less curb weight; same number of cylinders; slightly longer wheel base; much more shoulder, hip, head and leg room; greater overall width and less height than he received in the more expensive 1929 Buick.

Obviously the 1949 Chevrolet is an even better buy than the 1929 Buick. But we hear many small voices asking "When can we buy a postwar counterpart of the 1929 low-priced car?" —p. 39

* * *

AIR-ELECTRIC GAGING: Several months ago in this space it was said that the plant erected by Oldsmobile to build the new Kettering engine is almost as interesting and as noteworthy as the revolutionary engine itself.

One reason why the plant is distinctive is because it is equipped with new types of automatic gaging equipment. Cylinder blocks, heads, pistons, piston pins, connecting rods, crankshafts and camshafts, along with the proper matching of sets of components for assembly into an engine, are gaged accurately and automatically by several types of air-electric gaging devices.

Unit gages operate against individual microswitches, which actuate signal lights—red for undersize, green for oversize and blackout for within tolerance limits. The system illustrates the length to which automaticity can be carried when every detail of plant and equipment can be planned specifically for the production of a single product. —p. 56

* * *

GOOD PLACE TO WORK: An unusual modernization program has been completed at the East Springfield, Mass., gray iron foundry of Westinghouse Electric Corp.

Heaters of the unit and curtain type are capable of maintaining a temperature of 60° F inside the building with outside temperature at 0° and a 15 mile per hour wind. Dry dust collectors remove 2430 pounds of dust daily and wet dust collectors carry away dust in sludge form in the amount of 1350 pounds daily. Ventilators effect 8.4 complete changes of air in the foundry every hour. Mechanization, consisting chiefly of conveyors, has reduced the amount of material handled daily by the 75 employees from 1470 tons for the previous manual set-up to 294 tons for the mechanized arrangement.

The entire cost of the modernization program, which was $1,250,000, was sold on the basis of improved working conditions. However, there was another important advantage: the capacity of daily melt was increased from 60,000 to 100,000 pounds. —p. 60

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

ACCENT ON SOCIAL GAINS— Falling consumer prices are taking much of the wind out of the sails of unions pressing for fourth-round wage increases (p. 28). This has led to a shifting in strategy of labor leaders who now are emphasizing demands for pensions, retirement programs and social security benefits ahead of straight wage advances. The "fringe" demands of the past several years likely will become the central issues in 1949 bargaining discussions.

U. S. LOANS FOR EXPANSION— Following President Truman's proposal to encourage government participation in the expansion of industry, a bill to provide $15 billion for RFC loans for new plants has been introduced in Congress (p. 25). Should such a huge sum be made available, on presumably easy terms, the way may be opened for sectional interests to seek industrial installations for their areas. The Lone Star Steel Co., with the backing of Texas congressmen, is asking for $65 million to build open hearths and finishing mills near Daingerfield.

SHIFTING MARKETS— A gradual move appears underway by steel producers to withdraw on a selective basis from markets in which they cannot remain competitive under more normal supply-demand conditions (p. 26), and to build up service in their natural market areas. This is causing hardship among some steel users who lose their mill source of supply at a time when it is difficult to get on the books of nearby producers. It is, however, a logical move on the part of the mills. Meanwhile, hearings on legislation to clarify existing confusion over pricing policies are underway in Washington (p. 27).

MILITARY BUYING GUIDE— An index showing which military purchasing offices have been assigned responsibility for procurement of items covered by the armed services' co-ordinated purchasing program appears in this issue (p. 31). It will help simplify the problem of manufacturers wishing to sell to the armed services.

NEW AUTO MODELS—Chrysler lines of 1949 lack the extreme body styling of other manufacturers, but feature many engineering improvements (p. 39). Provision is made to meet competition on a price basis by introduction of smaller models in two of its lines . . . . Chevrolet models have been launched with one of the greatest publicity barrages ever to accompany new models (p. 40). General Motors first postwar auto show in New York is one of the largest ever staged.

STEEL FATIGUE TESTS— Some surprises have been uncovered in the steel fatigue studies being conducted for the Office of Naval Research by the University of Illinois (p. 32). The accepted S-N curve is questioned, among other disconcerting findings.

FOREIGN—United Kingdom automobile production is increasing, and promises (p.35) to pace the metalworking industries in 1949. Now the leading steel consumer, the automotive industry is expanding in the production of tractors and other farm implements. Western Germany expects to double production of the Volkswagen this year (p. 35) and attainment of the goal may depend on what is done with German industrial plant. A report on the latter problem has been submitted to the State Department by the Humphrey committee (p. 29). Italy and Portugal are undertaking power building programs (p. 36).

HERE AND THERE IN INDUSTRY— Steel exports dropped a third during the first 11 months of 1948 from the comparable 1947 period (p. 36) . . . Central Iron & Steel Co. has doubled its plate finishing capacity and substantially increased ingot capacity under a $2 million expansion program (p. 42) . . . First two parts of the new renegotiation rules have been drafted (p. 34) by the National Military Establishment . . . McClouth Steel Co. has poured its first steel at its new Trenton, Mich., plant (p. 27).

STEEL ALLOCATIONS

and

What We Are Doing About Them

As you know, the Steel Products Advisory Committee recently agreed to a six month extension of voluntary allocations of steel for most industries already included in the allocation program—and the President has now asked for authority to establish priorities and allocations for key materials in short supply. On the face of it, this action and stepping up of steel requirements for defense and the Marshall Plan point toward a continuation of peak demand for steel.

But remember that steel distributors in general and Ryerson in particular will always be in there battling to make available to you the largest possible tonnage.

Last year Ryerson was able to serve over 50,000 manufacturers, builders, and utilities. This year we expect to serve many thousands more.

Since it's our job to provide steel from stock, we never consider that we are doing you a favor when we take an order. Instead, we count ourselves fortunate to be able to supply what steel we can, to help keep the wheels of industry turning.

We may not always have exactly what you ask for, but our experienced steel men can usually suggest a practical alternate. So we urge you to get in touch with us whenever you need steel.

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Easier U. S. Loans for Expansion?

Proposal to liberalize Reconstruction Finance Corp. grants for building new plants seen encouraging sectional interests to seek federal assistance

WILL President Truman's proposal for government financing of steel and other industrial expansion be effected through liberalized Reconstruction Finance Corp. loans? Will such a policy invite pork-barrel maneuvering among congressmen to obtain new industrial establishments for their districts? Will the greater federal funds thus made available for expansion tend toward socialization of industry?

These are some of the questions being asked as the new Truman administration gets underway.

Implementing the Chief Executive's State of the Union proposal for U. S. financing of industrial expansion comes Rep. Wright Patman (Dem., Tex.) with a "Full Employment Bill of 1950," providing $15 billion for the RFC to lend to public or private agencies for use in industrial expansion.

Lone Star Asks Loan—From Representative Patman's home state comes an application from the Lone Star Steel Co. asking an RFC loan of $65 million to finance a projected steel mill, including several open hearths and tubular goods mills, at Lone Star, Tex.

Texas members of Congress, headed by Representative Patman, are prepared to back the application to the limit. They contend that the product of the projected plant, oil country tubular goods, is in critically short supply in northeastern Texas and is urgently needed to promote petroleum development and production in the Texas area.

Other loan applications may be forthcoming from Texas for Representative Patman says the proposed Lone Star plant is only one of six needed in that section.

Pork-Barrel Financing? — While use of RFC loans by industry for new plant construction is not new, industry observers are wondering whether the new lending powers proposed for the RFC, and the huge funds proposed to be made available, will be the means by which the government-sponsored expansion program, long advocated by labor unions and left wingers in the administration, is to be attempted. They point out such a scheme might encourage political and geographical groups to dip into the pork barrel to obtain funds to build industrial plants in their areas, regardless of the econonomics involved. They recall the rush of groups for "their share" of federal funds for PWA projects during the 1930s.

Asks $15 Billion for RFC Loans

STIMULATION of industrial activity in under-industrialized areas of the country is one of the main purposes of the Full Employment Bill of 1950 introduced by Rep. Wright Patman (Dem., Tex.) and Sen. John J. Sparkman (Dem., Ala.) and James E. Murray (Dem., Mont.). Under the bill the Reconstruction Finance Corp. would be empowered to lend up to $15 billion to private or public agencies for industrial expansion. The states and such agencies as the TVA could get money to build and operate plants if private industry failed to undertake desired expansion. The decisions would be made by seven $25,000-a-year RFC directors assisted by a citizens' advisory board.

Another purpose of the bill is to give the government another weapon to fight cyclical depression and unemployment. A number of congressmen have termed the bill "socialistic," and contend it would place in the hands of politicians great powers to determine the lines of future industrial growth in the U. S.

Lone Star Plans Steel Plant

LONE STAR Steel Co., which operates a 1200-ton blast furnace and oven coke plant at Lone Star, Tex., near Daingerfield, applied last week for a $65 million loan with which to expand its plant facilities to include several open hearth furnaces and steel finishing mills.

Present plans call for production initially of finished oil country goods, but designs provide for further expansion and diversification of finished steel products. Lone Star officials estimate it would take from 18

War-built blast furnace of the Lone Star Steel Co. near Daingerfield, Tex., may become the nucleus of a new steel plant if the company's application for a $65 million loan is granted by the Reconstruction Finance Corp. Photo shows three stoves at left and the stack at right

months to two years to complete the additional facilities. When completed, total employment would be around 2600, compared to the present labor force of 1100.

Replacement of the present plant facilities including ore and coal mines has been estimated by outside engineers at $54 million. With the additional facilities included in the application to RFC the value of Lone Star's facilities would be increased to approximately $125 million. The present facilities were constructed by Lone Star as agent for Defense Plant Corp. and were completed in 1944.

Surveys were made recently for Lone Star to measure the company's market possibilities for products used in oil fields, pipelines and refineries. According to these surveys the company's natural market area includes Texas, New Mexico, Oklahoma, Kansas, Arkansas and Louisiana. Within this area, according to the survey, are 70 per cent of the nation's crude oil production; 75 per cent of the nation's proved oil reserves; and 88 per cent of its proved natural gas reserves. Present major centers for production of oil country goods are in the Pittsburgh and Great Lakes regions.

GM Sees 6,000,000 Cars in '49

GENERAL Motors Corp. fabricated into finished products 3,160,000 tons of finished steel in 1948, including its share in building 5,535,000 cars and trucks produced by United States and Canada. And enough steel is expected to be available for production of more than 6,000,000 units this year.

Declaring there is no substitute for steel, definitely tied up with development and use of mechanical power, C. E. Wilson, GM president, at New York last week, said this 3,160,000 tons was but 3 per cent above tonnage General Motors used during its previous peak model year 1940-41.

Although the steel industry produced much more tonnage last year than during the 1940-41 period, GM did not receive same percentage of total steel melted and rolled.

Elect Material Handling Officers

ELECTED to head the Material Handling Institute Inc., Pittsburgh, in 1949 were the following national officers: President, J. H. W. Conklin, Clark Equipment Co., Battle Creek, Mich.; first vice president, J. G. Bucuss, Acme Steel Co., Chicago; and second vice president, J. P. Lawrence, American MonoRail Co., Cleveland.

Mills Making Selective Withdrawals

More steel buyers complain of supply pinches as producers retreat to market areas in which they can be competitive under more normal conditions

APPROACH of a balance in demand and supply of steel is turning out to be only a mirage for many steel customers.

After experiencing three years of inability to obtain all the steel they needed, they have since early November seen signs indicating supply and demand may be more nearly in line with one another, perhaps by mid-1949.

While this might suggest steel companies soon would be looking for business, some steel consumers are finding their business is no longer wanted by their mill suppliers. Consumers were not surprised at this attitude while mills were on the multiple basing point pricing system and absorbing freight charges, for rising railroad freight rates made absorption increasingly costly. However, with consumers now paying the freight under the mill pricing policy adopted in 1948, they are finding it hard to understand why in numerous instances they are being cut off by their mill suppliers.

Favor Local Customers—Steel company officials give this explanation: "When you can get steel from any mill you will buy it from the nearest one. In preparation for the future we must now try to provide steel to and build good relations with consumers nearest our mills."

However, this transition is leaving some consumers with little or no sources of supply. Theoretically, it would seem that business dropped by one mill would be picked up by another which too had withdrawn from some customers or territories. Actually, it doesn't work out so precisely, at least not immediately, and meanwhile some consumers are desperate for steel. They challenge assertions that current market readjustments, particularly those of one producer, are building for the future. In short, the policy is shortsighted, say the consumers. But maybe it isn't shortsighted, particularly in view of the rise in freight rates; maybe it is two-way protection, say other observers. It's an advantage to mills to have csutomers nearby whether the customers are paying the freight under the present mill pricing system or whether the mills would again absorb freight in event there is a return to the multiple basing point practice.

Freight More Important— Extent to which freight rates on steel have become a determining market factor can be visualized from the accompanying table comparing 1938 and 1949, in cents per hundred pounds.

From	To Detroit Jan. 11, 1949	1938	To New York Jan. 11, 1949	1938
Pittsburgh	48.76	29	59.36	36
Youngstown	41.34	25	64.66	39
Cleveland	36.04	22	67.84	41
Buffalo	42.40	26	56.18	34
Chicago	46.64	28	82.68	78
Middletown	41.34	25	75.26	71
Harrisburg	67.84	64	38.16	23
Bethlehem	68.90	65	27.56	17
Sparrows Point	68.90	65	40.28	24

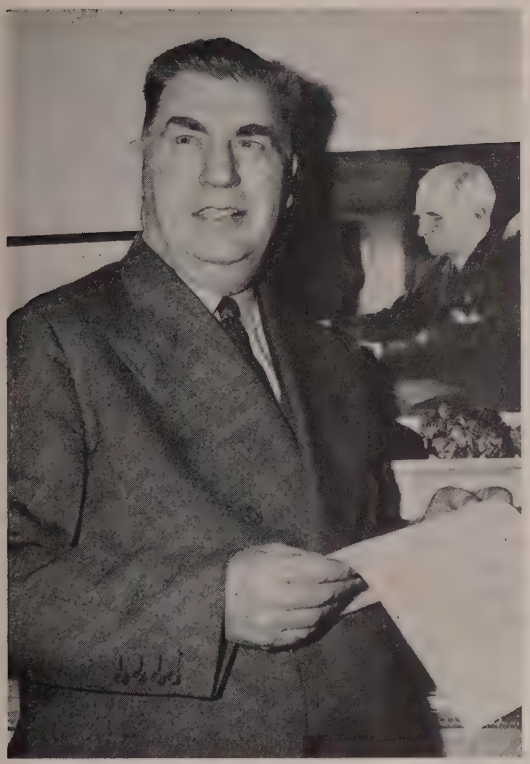
Selective Withdrawals — Bringing new attention to this market readjustment is the current move of one steel producer to sever business relations with certain consumers in an area where it had been thought the producer would remain competitive. The company declares it is not withdrawing from the area. However, it is known the producer is easing away from a number of consumers. It apparently is making a selective withdrawal; that is, it is keeping only the business that would appear to be the most lucrative in the future.

That is the pattern most withdrawals are taking. A mill will continue to sell only where it is competitive. Thus, a producer may sell plate but not sheet in one area whereas in another area it may not sell either but will continue to supply structurals and bolts and nuts.

One consumer related that the producer from which he has obtained all of his steel since 1941 has told him he can have no more plates whatsoever, and no sheets in the first quarter of 1949. However, the producer did promise to let him have some waster sheets. Thus far, none has arrived. With no historical purchasing record with other producers, this consumer is able to get only a small tonnage of wasters from another mill where he has a "couple of friends." This consumer's only other steel sources are warehouses and the gray market. He reckons he may be able to "get by" only because his company's current business requires less steel and because its customers in some instances can furnish the needed material.

Because of this selective withdrawal another consumer revealed it is dangerously near closing down.

One large steel producer which began withdrawing from distant sales



New chairman of the Senate Trade Policies subcommittee, which is studying means of clarifying the confusion over pricing policies, is Sen. Edwin C. Johnson (Dem., Colo.). Senator Johnson has proposed a bill amending the Federal Trade Commission Act and the Clayton Act to permit sellers to have access to distant markets and to absorb freight to meet competition. Hearings on the measure are underway in Washington before the committee. Informed observers believe the issue may be kept on a nonpartisan basis, a belief supported by Senator Johnson's statements and actions to date

areas when it still absorbed freight under the old multiple basing point pricing system is now reducing its sales and office forces in those areas.

Start Pricing Bill Hearings

CONGRESSIONAL committee hearings on the Johnson bill to clarify the status of delivered pricing practices are scheduled to begin Jan. 24.

The bill, introduced by Sen. Edwin C. Johnson (Dem., Colo.), chairman of the Senate Trade Policies subcommittee, would amend both the Federal Trade Commission Act and the Clayton Act to permit sellers to use pricing policies that would give them access to distant markets, and to promote competition.

Introduction of the bill is an outgrowth of extensive hearings in recent months by the Senate Trade Policies Committee, headed until the first of the year by Sen. Homer E. Capehart (Rep., Ind.), and commonly referred to as the Capehart committee. Demand for such a bill arose in industry after the U. S. Supreme Court's decision in the Cement case last year created confusion over pricing practices.

A boost to the Johnson bill was given last week by a report of the 46-man advisory council of the Senate Trade Policies Committee. The report declared a producer's right to absorb or equalize freight charges to meet competition must be made clear, and advocated clarification of what constitutes collusion, conspiracy or agreement in restraint of trade when applied to pricing policies.

Current hearings are designed to iron out the rough spots in the bill as drafted. Witnesses will include FTC representatives and other interested parties.

Urges Court Scrutiny of FTC

CLOSER SCRUTINY of the Federal Trade Commission by the courts is recommended by one of the commission's members, Lowell B. Mason, in a minority report for 1948 to Congress.

This would be accomplished by congressional action to broaden the scope of appellate court review of commission orders. "Without altering the commission's normal procedure, such an act would silence many of the criticisms now leveled at commission action and would increase public acceptance of its orders," Commissioner Mason asserts.

His other recommendations to Congress include proposals to: (1) Specifically forbid the commission to issue an order based on a finding of "reasonable possibility" of injury to competition; (2) limit commission proceedings against "knowing or conscious parallel action" on pricing to cases involving conspiracy; (3) determine whether a seller should legally be permitted to absorb freight systematically to meet competitors' prices; (4) consider effect of court approval of the commission's decision in the Morton Salt case which, according to Commissioner Mason, "for all practical purposes eliminates the right to give quantity discounts except in so-called trading items where the purchase price fluctuates in each transaction"; and (5) give trade practice conference procedure a statutory foundation more specific than the implied authority of the FTC Act.

Begins Cold Strip Operations

ACME Steel Co. has placed in operation at its Riverdale, Ill., plant the new cold strip mill which has been under construction since November, 1946. The unit, purchased from United Engineering & Foundry Co., Pittsburgh, is a 14 x 33 x 22 inch, 5-stand 4-high mill, and adds 120,000 tons annually to Acme's cold strip capacity. Housed in a new building 140 x 400 ft, it represents an investment of $2.5 million. The mill operates at speeds up to 3000 fpm, handling 8000 lb coils and rolling widths up to 18½ inches and gages 0.006 to 0.02 inches.

McLouth's New Furnace Pouring

FIRST heat of carbon steel was poured from No. 1 electric furnace at the New Trenton, Mich., plant of McLouth Steel Corp. on Jan. 10, a little over four months after construction was started. Piles were driven Aug. 31, first concrete poured Sept. 24, and the first steelwork erected Oct. 8. The 60-ton furnace is one of two purchased by McLouth from the WAA, and was once located in the Indiana Harbor, Ind., plant of Youngstown Sheet & Tube Co.

Ingots are 23x24x72 inches in size, weighing about 10 tons. Until the installation of a blooming mill, scheduled for May, ingots are being sold, the first going to General Motors, with Great Lakes Steel Corp. breaking them down to slabs and then to sheet and strip.

The McLouth plant is located on a 210-acre site at Trenton, with 1 mile of frontage on the Detroit river. Investment of $18.5 million is being made in facilities, which eventually will include three more 60-ton electric furnaces, blooming mill and a hot strip reversing mill, the latter scheduled for installation in July. No. 2 electric furnace will start melting Jan. 27, and two new units are on order for early delivery. Full capacity will be 30,000 tons per month.

"Fringe" Demands Move to Center

Labor unions to shift emphasis to pensions and other social benefits. Straight pay increase demands take second place, as falling prices weaken labor's arguments

ORGANIZED labor is beginning to recognize that continuing declines in cost-of-living items are weakening the unions' campaign for fourth round wage increases.

Increasingly, attention is being shifted from talk about rate increases and focussed on pension and welfare demands. What have been "fringe" demands since 1943 are likely to become the central demands of 1949.

From August to Nov. 15, the consumers' price index dropped 2.3 points. Substantial declines in components of the index have occurred since November and will show up in later index figures when they are compiled by the Bureau of Labor Statistics. Some observers expect the cost-of-living decline to be large enough to require a downward adjustment in wages which are hitched to the index.

The General Motors contract, for example, provides for a quarterly adjustment with wages being raised or lowered 1 cent an hour for each 1.14 point rise or fall in the consumers' price index. Downward revision of GM wages would strike a powerful blow at fourth round pay increase demands of other unions.

Reuther Emphasizes Welfare—This has been recognized by Walter Reuther, president of the United Automobile Workers, who has told his unions to ask for "an adequate pension and retirement program" and a comprehensive social security plan from Ford, Chrysler and other companies. Wage increases to raise purchasing power to the 1946 level also will be asked, but such demands apparently will take second place to the social security demands.

Sanctioned by Parent Union—The shift in emphasis toward social benefits is in line with a CIO convention resolution adopted last November at Portland, Oreg., when the union urged its affiliates to embark immediately on a vigorous campaign to obtain pension, health and welfare benefits through collective bargaining. The union also resolved to call for "continually increasing wage levels" and no top union leader yet has gone so far as to say the security demands will be a full substitute for wage increases.

However, it is possible that the straight pay demands may be washed out across the bargaining table, provided the cost of living continues to fall, and provided that the social security demands can be made a subject for collective bargaining.

Steelworkers' Program—The United Steelworkers demands will include a program covering life insurance, hospitalization, cash sickness payments and other medical benefits. These demands reached the serious discussion stage during negotiations last year and union leaders believe they have a good chance to win some concessions this summer.

UAW Program—Specifically, the auto workers' program, as outlined by Reuther, calls for: (1) Pension and retirement program; (2) comprehensive social security, including health, hospitalization, medical, surgical, disability and life insurance provisions; and (3) a wage increase to restore buying power of wages to the level of June, 1946. Earlier, Reuther had estimated this to require a 15-cent hourly increase.

Some contracts of the UAW provide that wages are to be the only subject for discussion this year. In this case, the UAW president advised the locals to ask that social security demands be made a bargaining subject and if employers refused, then to make wage demands large enough to cover the cost of such welfare demands.

When Negotiations Start—Bargaining in the major industries will get underway in May and June. Although some contracts expire before then, no clear pattern can be expected before one of the major auto, steel or electrical companies sign.

In the automotive field, Chrysler and Ford contracts expire June 15, GM runs through to 1950.

The Westinghouse contract with the CIO electrical workers expires Mar. 31. General Electric's contract runs to 1950 but provides for a reopening before that time.

Contract between United States Steel and the United Steelworkers provides for reopening in July.

John L. Lewis' contract runs to July 1 but may be reopened on 30 days' notice.

Shown leaving the White House after a conference with President Truman are these top leaders of the CIO. Left to right: Arthur Goldberg, CIO and United Steelworkers general counsel; James B. Carey, CIO secretary-treasurer; Philip Murray, CIO and USA president; Jacob Potofsky, Amalgamated Clothing Workers president; Emil Rieve, United Textile Workers president. NEA photo

New Pension Plan at Weirton

PENSION plan covering 12,500 production and salaried workers and providing a minimum retirement income of $100 a month for all participating employees has been negotiated by Weirton Steel Co. and the Weirton Independent Union.

Under the program, each qualified employee will receive a monthly check which, added to his social security pension and his annuity payment from the National Steel retirement annuity plan, will bring his total income from all three sources up to $100 a month.

Employees who meet eligibility requirements but do not participate in the retirement annuity plan will also receive benefits, but their payments may be less than $100 a month. Membership in the annuity plan is volun-

tary and open to all employees 30 years of age with 5 years of credited service. The plan calls for regular monthly contributions by both employee and the company under a group annuity contract underwritten by an insurance company.

Honeymoon Nearing End?

HEAVY-HANDED tactics by labor union leaders are arousing resentment among some of the pro-labor members of the 81st Congress. Sen. Elbert E. Thomas (Dem., Utah), chairman of the Senate Labor & Public Welfare Committee, has become impatient over union demands that action on labor legislation be confined to repeal of the Taft-Hartley Act and re-enactment of the Wagner Act, with revisions to the latter measure to be considered later. Senator Thomas has taken a firm stand that any bill brought before the Congress will be subject to the usual revisions and amendments and will not be railroaded through at the behest of the union leaders.

Friends of labor in Congress say that labor leaders are going to lose ground if they do not show more tact. For example, the CIO is getting out a "Handbook for Congressmen" so that no "congressman will have the excuse that he didn't know what the unions wanted" when he votes on legislation.

Resentment flared when a 45-man group from the United Electrical Workers-CIO descended on Washington and conducted a door-to-door campaign in the House and Senate office buildings for immediate repeal of the Taft-Hartley Act and a full return to the Wagner Act.

Steel Payroll Sets New Mark

TOTAL payroll of the iron and steel industry in the first 11 months of 1948 exceeded the record payroll for all of 1947 by more than $40 million, according to the American Iron & Steel Institute.

Employment, which dipped slightly after August's high, set a new postwar record of 646,200 in November, topping the previous peak by 1700 employees and exceeding the level of November, 1947, by 22,700.

Another new high was set in the earnings of hourly, piecework and tonnage workers which averaged $1.721 per hour, compared with $1.699 in October and $1.587 in November, 1947. These workers' average work week was 39.8 hours in November, slightly above October's average of 39.5 hours.

Dismantlings Row

In Western Germany passed by ECA to Secretary of State Acheson for diplomatic negotiations

THE OLD dispute over German dismantlings, between the United States on one side and Britain and France on the other, has been handed to the new Secretary of State, Dean Acheson, following completion of a report by Economic Cooperation Administration's Industrial Advisory Committee on dismantlings in the Reich.

Although the committee report has not been made public, its recommendations are believed to call for a boost in German steel and metalworking production as an aid to the European Recovery Program. ECA Administrator Paul G. Hoffman is required by law to request the Secretary of State to obtain the agreement of those countries concerned if cessation of German dismantlings will "effectively serve the purposes" of ERP. One estimate is that Germany could easily produce 13 million tons of steel a year, instead of the 10.7 million tons to which the Ruhr is now limited, if dismantlings were stopped.

Last September Mr. Hoffman appointed a committee to study the matter and named George M. Humphrey, president of M. A. Hanna Co., as its chairman. At that time Britain and France agreed to curtail their dismantlings, but balked when the Humphrey committee recommended keeping 167 plants intact in Western Germany. France wanted only 120 left standing, while Britain agreed to leave 140. The final report of the Humphrey committee, it is believed, attempts to reach some compromise.

Machine Tool Inquiries Up

RECENT upswing in inquiries for new machine tools received by Chicago builders has revived the hope for greater sales volume as the year progresses. An encouraging factor is that new appropriations in many companies allow for some tool purchases over and above replacements.

New England builders report that the Navy is buying machine tools in slightly better volume, inquiring for 15 to 20 machines weekly of late. Builders of special machinery for the metalworking industries who have had heavier backlogs than the average machine tool shop are beginning to reduce them. One builder in Connecticut with a 2-year backlog just six months ago now has forward orders for about one year and is taking selective foreign orders. Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn., has been awarded a contract for a cold strip reversing mill for the Navy laboratory, White Oak, Md.

SHOP DEMONSTRATION: Workers making carbide burs at Pratt & Whitney shops in West Hartford, Conn., gave up a major portion of their noon hour (at their own request) to watch P&W field engineers put on a carbide burring show, demonstrating performance on hardened steel, stainless and other tough materials. Many tried the burs for themselves, gained a new appreciation of their handiwork

Expect Heavy Scrap Consumption

Active steelmaking operations assure no diminution in overall demand despite easing of pressure on market, delegates to Institute of Scrap Iron & Steel convention report

LAST year the steel mills and foundries of the nation consumed more than 29 million gross tons of purchased scrap in producing 88,500,000 tons of steel ingots and 13,500,000 tons of castings. That was a lot of scrap, in fact, more than was ever before collected in any one year in history.

This year, consumption may be even larger if predictions of a 92 million ton steel production year come true. Consequently, despite recent easing of pressure for supplies with resulting downturn in prices, efforts must be continued to draw out every pound of metal possible if steel operations are to be supported at the high level of the past several months.

That was the view expressed by several speakers addressing the 21st annual convention of the Institute of Scrap Iron & Steel at Cincinnati last week, and it seemed to reflect general sentiment among the 1200 scrap dealers and brokers attending the meeting, held at a time when the scrap market is having the worst case of jitters in almost two years.

Scrap is in admittedly better supply today than it has been in years, but long-term supply prospects still are cause for concern.

Feature of the 2-day convention was the banquet address by Vice President-Elect Alben W. Barkley, who flew from Washington, and who called upon businessmen to co-operate in every possible way with the government. Business and politics are partners, he said, and they are inseparably connected.

Discuss Problems—Emphasis at the scrap convention business sessions was on ways and means for helping the dealers handle the problems which loom ahead in their industry in 1949. The scrap industry today is a billion dollar industry and its problems have mounted in step with its growth. Yard safety, mechanization of the industry and trade ethics were explored by several speakers. However, while current market conditions were not discussed formally, there was no question that the present disturbed situation was a matter of grave concern to all those attending the meeting.

The recent price break is attributed by most authorities to a combination of factors. General business uncertainty since late last year has contributed a dampening influence on trade sentiment. At the same time moderate winter weather has aided abnormally heavy collections for the season, and has facilitated yard preparation and handling. Shipments have not been hampered to any particular extent. As a result mill inventories today are the largest in years, some steelmakers reputedly holding 60 days' supplies at capacity operations. This improved supply position of the mills has enabled them to be more selective in accepting shipments than has been the case in years, and rejections, consequently, have been numerous.

Supplies Can Melt Away—It was emphasized at the convention, however, that the present comfortable supply position of the mills is temporary; that they cannot hold out of the market indefinitely if the present high steel operating rate is to be maintained. Under pressure of 100 per cent capacity operations present mill inventories will quickly melt away. Consequently, it is not felt the bottom is about ready to fall out of the scrap market, certainly not on the steelmaking grades. With respect to foundry grades, the scrap men are less optimistic since the sharp price decline on cast grades follows upon a definite slowing down in foundry operations. Such is not the case with steel production.

Commenting on the situation, Edwin C. Barringer, executive vice president of the institute, said that consumers have a degree of responsibility for insuring the most efficient operation of the scrap industry, pointing out that at the first sign of comfort in supplies and inventories, it is not a wise policy, in the long run, for buyers to withdraw from the market, discourage collections, and dry up the sources which have made their comfortable supply position possible.

Such tactics, he said, only play into the hands of forces which would control the steel industry and take a long step toward nationalization of industry.

One of the outstanding contributions to the convention was an address by Leo F. Reinartz, general manager, Middletown Division, Armco Steel Corp., in which he presented a steel man's view of the scrap iron problem. Pointing out that 1949 steel production may top 92 million tons, he said about 1,500,000 tons of the increased tonnage may come from new electric furnace installations, which use only scrap in charges. This means greater call upon the scrap industry, and it comes at a time when it appears plant scrap production in the steel mills is near its peak. Consequently, the burden of providing 2 million to 3 million more tons of scrap in 1949 will fall on the shoulders of the scrap trade.

Explains Rejects—Explaining why the steel mills reject many cars of scrap shipped to them these days, Mr. Reinartz said mechanical preparation and metallurgical difficulties are involved. The mechanical problems, connected with the proper size and weight of scrap iron, usually mean slow charging and loss in production. The metallurgical problems are more serious, he said, because in addition to losing furnace time, the steel, after it is poured into ingots, may be of no, or at best, of limited commercial value. Some of the deleterious substances that come to the mills as scrap iron, especially in No. 2 bundles, include: Rubber; iron oxide or scale; ashes; tin; copper; nickel and molybdenum; antimony; lead; zinc from galvanized sheets; cast iron; boiler tubes and boiler plate; enamel iron.

Taking a look ahead in steel, Mr. Reinartz believes that large electric melting furnaces are here to stay as ingot producers, but as peak demand drops off, uneconomical melting and refining of commodity ingot steel in small electric furnaces will be discontinued. Large electric melting furnaces produce ingots of high quality with considerably higher yield than in open hearth furnaces, he said. High production rates and reasonable costs can be obtained if sufficient electric power is available.

Following the closing business session Jan. 17, the following officers for 1949 were elected: President, Edward L. Solomon, Max Solomon Co., Pittsburgh; 1st vice president, Stanley M. Kaplan, M. S. Kaplan Co., Chicago; 2nd vice president, Clarence C. Cohen, I. J. Cohen & Co., Kansas City, Kans.; secretary, Ralph Ablon, Luria Bros. & Co. Inc., New York; and treasurer, Samuel G. Keywell, the Samuel G. Keywell Co., Detroit.

Scrap Imports from Germany Rise

IMPORTS of ferrous scrap from Germany totaled 351,000 tons during the last six months of 1948. First half receipts amounted to 4000 tons, making a yearly total of 355,000 tons.

Military Purchasing Guide

AN "Index of Military Procurement," showing which purchasing offices have been assigned responsibility for buying products covered by the co-ordinated purchasing program of the armed services, is shown below. Under the co-ordinated program, each service has been assigned certain items to buy for all three departments; thus the Navy buys all hand tools, the Army automotive equipment, etc.

To sell to the Army, Navy or Air Force any of the products listed below, get in touch with the Military Purchasing Office cross-indexed to the item you have for sale. This list of products, and the purchasing offices that buy them, is compiled as of Jan. 1, 1949. The list does not include all items bought for military use; it will be enlarged from time to time as the responsibility for purchasing other items is assigned to specific procurement offices. To find a military buyer for items not now included in this list, write to Logistics Division, Department of the Army, Washington 25, D. C.; Office of Naval Material, Department of the Navy, Washington 25, D. C., and Procurement Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O.

PURCHASING OFFICES

Key

ARMY

A-1, Chicago Procurement Office, Corps of Engineers, 226 West Jackson Boulevard, Chicago 6, Ill.

A-2, Atlanta Lumber Branch Office, Corps of Engineers, P. O. Box 1889, Atlanta 1, Ga.

A-3, Portland Lumber Branch Office, Corps of Engineers, 628 Pittock Block, Portland 5, Oreg.

A-4, Procurement Division, Marietta Transportation Corps Depot, Marietta, Pa.

A-5, Chief, Supply and Facilities Div., Office, Chief of Transportation, Washington 25, D. C.

A-6, Chicago Quartermaster, Purchasing Office, 1819 West Pershing Road, Chicago 9, Ill.

A-7, Headquarters Quartermaster Market Center, 226 West Jackson Boulevard, Chicago 6, Ill.

A-8, Watertown Arsenal, Watertown 72, Mass.

A-9, Rock Island Arsenal, Rock Island, Ill.

A-10, Frankford Arsenal, Philadelphia 37, Pa.

A-11, Springfield Armory, Springfield 1, Mass.

A-12, Picatinny Arsenal, Dover, N. J.

A-13, Watervliet Arsenal, Watervliet, N. Y.

A-14, Detroit Ordnance District, 6301 West Jefferson Avenue, Fort Wayne, Detroit 17, Mich.

JOINT

(Army-Navy and Air Force)

J-1, Armed Services Petroleum Purchasing Agency, Tempo 4 Building, Room 11005, Washington 25, D. C.

J-2, Armed Services Medical Procurement Agency, 84 Sands Street, Brooklyn 1, N. Y.

NAVY

N-1, Bureau of Aeronautics, Navy Department, 18th Street and Constitution Ave., Washington 25, D. C.

N-2, Bureau of Supplies & Accounts, Fuel Division, Navy Department, Arlington Annex, Washington 25, D. C.

N-3, Bureau of Ships, Navy Dept., 18th Street and Constitution Ave., Washington 25, D. C.

N-4, Pr. 5, Bureau of Ordnance, Navy Department, 18th Street and Constitution Ave., Washington 25, D. C.

N-5, Pr. 6, Bureau of Ordnance, Navy Department, 18th Street and Constitution Ave., Washington 25, D. C.

N-6, Bureau of Yards and Docks Annex, Navy Department, Washington 25, D. C.

N-7, Naval Aviation Supply Office, Oxford Ave. and Martins Mill Rd., Philadelphia 11, Pa.

N-8, Navy Purchasing Office, Navy Department, 18th Street and Constitution Ave., Washington 25, D. C.

N-9, Navy Purchasing Office, 1206 South Santee Street, Los Angeles 15, Calif.

AIR-FORCE

AF-1, Procurement Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio

Aircraft Parts and Equipment

Aircraft engines, propellers, and frames ...AF-1, N-1, and N-7
Lifeboats, rigid, air-borne AF-1

Cameras, Film and Photographic Equipment

Motion- and still-picture equipment and sensitized materials AF-1
Photographic chemical preparations AF-1
Photographic processing and finishing equipment and supplies AF-1
X-ray film, medical J-2

Cutlery and Hand Tools, Including Food-Handling Equipment

Cutlery, food processing (Including butchers, canners, fishery, and bakery) A-6
Cutlery, industrial (Including shoe, rubber, linoleum, woodcarvers, and paper hangers) ...N-8
Edge tools, files, rasps, and saws N-8
Hand tools N-8
Kitchen utensils, tools, and cutlery and tableware (Except silverware) A-6
Mechanics' measuring tools N-8

Construction, Mining, and Excavating Equipment

Construction; mining and excavating equipment (Mining machinery, rock-drilling and earth boring; power excavators, wheel-mounted; dredging equipment; scrapers; tractors, contractors; loaders; crawler carts) A-1
Contractors' jacks (For supporting trench sidewalls, concrete forms, and related uses) ....N-8 and N-9
Graders and maintainers .....N-8 and N-9
Logging equipment A-1
Oil field producing equipment N-8
Power excavators and attachments (Track laying only) .....N-8 and N-9
Road-making machinery:
Bituminous mixing, paving and related equipment A-1
Concrete mixing, paving, placing, and related equipment, including cement handling and placing equipment .....N-8 and N-9
Road and pavement clearing and cleaning equipment, except tractor and truck attachments .....N-8 and N-9
Road and pavement repair, marking, leveling, and demolition equipment A-1
Scaffolding, adjustable and demountable A-1
Stabilizing, compacting, and soil-preparation equipment for roads and streets, except tractor and truck attachments A-1
Wood materials, crude and fabricated (Lumber) .....A-2 and A-3

Motor Vehicles, Including Amphibious Landing Craft

(See also Railroad Rolling Stock, Maintenance Parts, and Equipment)

Amphibious military motor vehicles (Except landing vehicles tracked) A-14
Landing vehicles tracked N-3
Passenger carrying vehicles, trucks A-14
Tractors: Earth moving, mining, agriculture (Excludes materials handling) A-1

Railroad Rolling Stock, Maintenance Parts, and equipment

(See also Motor Vehicles, Including Amphibious Landing Craft and Tractors)

Locomotive cranes and derricks N-6
Railroad construction and maintenance equipment —Power driven A-1
Railroad transportation equipment; except items of special design or peculiar to a particular department A-5
Rolled wheels, axles, track accessories (wrought steel wheels, wheel centers, axles, and tires) A-4

Guns, Rockets, Ammunition, and Ordnance Equipment

Antiaircraft carriages, mounts, and recoils ...A-8
Artillery carriages, mounts, and recoils A-9
Artillery carriages, mounts, recoils, and transport wagons for 8-inch gun and 240 mm. howitzer only A-8
Artillery shells and projectiles .....A-10 and N-5
Bayonets A-11
Bombs, fin assemblies, and subassemblies ...A-12 and N-5
Cartridge clips A-11
Demolition and shaped charges A-12
Fire control equipment (Except range indicator and binocular Navy) A-10
Fuzes, mechanical, time, and V. T.....A-10, A-12 and N-5
Guns, howitzers, mortars, and rifles; 20 mm. and above A-13
Hand carts A-9
High explosives, propellents, blasting agents, supplies, and miscellaneous explosives N-5
Launcher, grenade A-11
Launcher, rocket 2.36 and 3.5 .....A-9
Links, metallic belt—Cal. .30, .50, .60 .....A-9
Machine guns, .30 to .50 cal., except air; also .60 cal.; machine gun trainers, mounts, and tripods A-9
Machine guns, .30 to .50 cal. air A-11
Military tanks, armored cars, self-propelled artillery and other armored combat vehicles..A-14
Mines, naval and aerial, and components N-5
Navy machine gun mounts for boats N-4
Pyro powder N-5
Rockets, mines, signals, grenades, and components .....A-12 and N-5
Scabbards A-9
Small arms ammunition A-10
Small arms (rifles, carbines, submachine guns, pistols, revolvers, and shotguns) A-11

Petroleum, Oils, and Lubricants

Crudes, petroleum and mineral J-1
Fuel, mineral, and shale oil J-1
Gasoline and components J-1
Lubricants, including gear lubricants, greases, oils, and oil base stocks J-1
Naphtha solvents J-1
Petroleum gases J-1
Petroleum products, including waxes, petrolatum, and related items J-1

Watches, Clocks, and Parts

Chronometers N-7
Clocks, spring and electric, including movements and parts N-7
Watches, complete (Including stop watches, watch parts, and movements) A-10

[1] Food and Food Products, Including Beverages

Animal oils and fats .....A-6 and A-7
Baking powder, yeast and other prepared leavening agents .....A-6 and A-7
Beverages .....A-6 and A-7
Butter and margarine A-7
Flour and related products A-6
Food products, perishable A-7
Food products, non-perishable A-6
Sugar and molasses A-6

Miscellaneous

Agricultural machinery and implements, including tractors A-1
Coal N-2
Coke N-2
Combat ships and landing vessels N-3
Domestic water systems (Power operated units) shallow and deep well .....N-8 and N-9
General purpose industrial machinery for crushing, pulverizing, screening, and mixing N-8
Lifeboats, ship-borne A-1
Medical supplies J-2
Saw mills (Complete units) A-1
Sporting and athletic goods A-6

[1] In addition to the subsistence items (food, food products and beverages) bought by the Department of the Army (A-7), various subsistence items are, by arrangement, purchased by the Navy.

Windows of Washington

President's request for $4 billion tax increase rouses protests. Congressmen growing more cautious on increasing expenditures as soft spots appear in economy

PROTESTS over the President's request for a $4 billion increase in the federal taxes are gaining both in and out of Congress. Consensus, as expressed by such informed parties as Beardsley Ruml of "pay-as-you-go" fame, and by the economists of the Chamber of Commerce of the United States, is that the President has not proved the necessity for this additional tax load.

In Congress major attention is being given the President's budget which in the opinion of many leaders could be trimmed substantially. Rep. Charles Halleck (Rep., Ind.) has given a horseback opinion that the President's many new requests, if granted, would increase the federal government's financial needs by at least $12 billion yearly.

So, though early indications were that the 81st Congress would not be an "economy" Congress, the trend of at least some of the thinking is in that direction.

New Bookkeeping—One of the facts uncovered by study of the President's budget is that he has based it on the new bookkeeping setup which now deducts tax refunds from gross receipts instead of showing them as expenditures, as in previous years. Inasmuch as these refunds are running between $2 and $2.5 billion, that means that the President's request for $41.9 billion for fiscal 1950 swells to $44 billion on the old basis. It means he is asking roughly $3.7 billion more than a year ago instead of $1.7 billion as indicated in the budget just presented.

Then, at various places in the President's budget message appear references to additional requests he proposes to relay to Congress later on. These include military aid to foreign countries, economic aid to Turkey, Greece, China and Korea, etc., all expected to come to close to $2 billion. And the message frankly predicted considerably higher federal expenditures in fiscal 1951.

Congressmen Cautious — Considering various factors, it is certain that many objections will be aimed at the President's fiscal program. With signs of an easier business situation and some unemployment developing, many legislators think it is time to slow down federal outgo. Many of them also are worried over the incontrovertible fact—as former President Hoover has said on a number of occasions recently—that the existing tax load on corporations is a serious brake on the raising of new equity capital, and seriously endangers our free enterprise system.

Where does all our federal money go? Those interested can get a copy of the budget from the Superintendent of Documents, Government Printing Office for $6, or a copy of the summary for $1.25.

Titanium Book Delayed

SEVERAL hundred of this magazine's readers who followed the suggestion (STEEL, Dec. 27, p. 32) to write to the Office of Naval Research, Editorial Branch, United States Navy, Washington 25, D. C., for copies of the book containing the discussions at the recent day-long symposium on titanium, will receive their books but with some delay. All participants have been asked to check their contributions and report corrections; not all have been heard from yet. The ONR now hopes to have this book ready for distribution between Mar. 1 and 10.

JAMES BOYD

Pay day will be a novel experience for Mr. Boyd, Bureau of Mines head, who will receive his first salary check in 18 months in February. Named by President Truman in August of 1947 as director of the bureau in the face of violent objections by John L. Lewis, United Mine Workers head, the Republican Senate in the 80th Congress refused to confirm him. Mr. Boyd stuck to his post, which pays $10,000 a year, with odds favoring a salary increase by Congress. Born in Australia, Mr. Boyd graduated from the California Institute of Technology in 1927 and later served as dean of the Colorado School of Mines.

To Push Trade Agreement Bill

PROMPT action in getting on the House and Senate calendars a bill to extend beyond the present Mar. 31 expiration date the Reciprocal Trade Agreements Act, free of the restrictions imposed by the Republican 80th Congress, has been promised President Truman by Chairman Walter F. George (Dem., Ga.) of the Senate Finance Committee and Chairman Robert L. Doughton (Dem., N. C.) of the Ways and Means Committee.

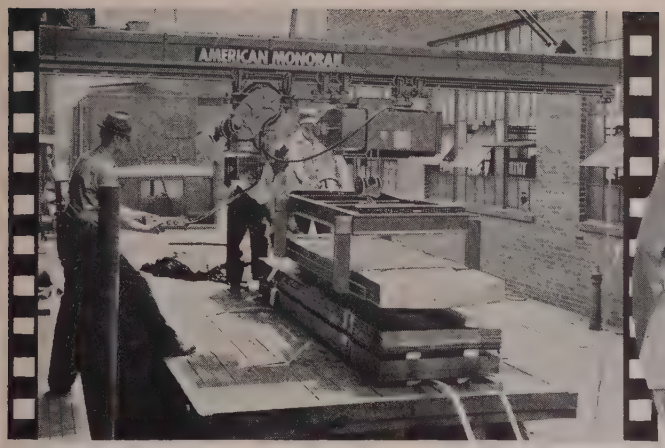
The two chairmen have agreed to get final congressional approval by the end of February if possible. They agreed that the President's request should be granted in full. President Truman has asked extension of the act until June 12, 1951.

Steel Studies Bring Surprises

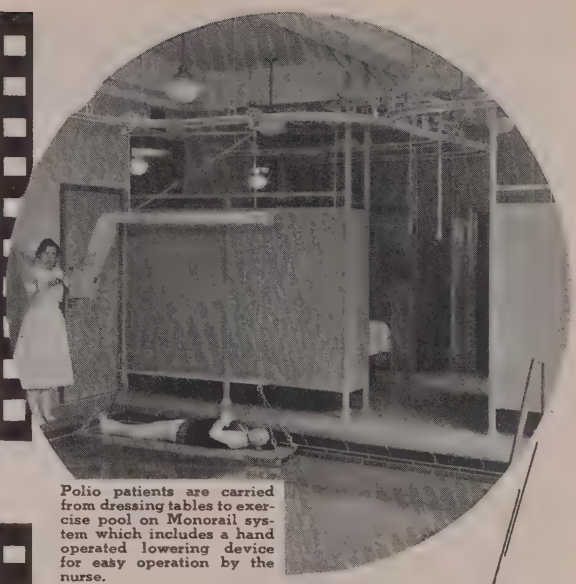
RESULTS to date of the steel fatigue study which is being conducted for the Office of Naval Research by the University of Illinois prove that important criteria now widely used in designing machines and structures are open to question. In particular, according to Irvin R. Kramer, ONR metallurgist under whose supervision the work is being done, the accepted S-N curve has been found wanting; this is the curve obtained by vertical plotting of stress values and horizontal plotting of the number of revolutions required to cause failure of the test specimen.

In the tests, Mr. Kramer told STEEL that breaking points have scattered to form a wide band, making it impossible to associate a definite S value with a definite N value, and vice versa. The study now is to be pushed to determine the extent of the variation in the S-N relationship for steels of the same composition, and to ascertain the cause of the variation.

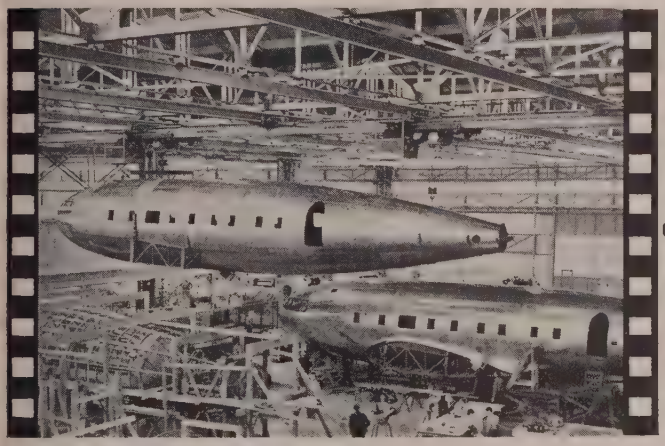
Find Variations—Another disconcerting finding, according to Mr.



Another demonstration of the MonoTractor drive includes a swinging jib for passage of the carrier over a truck for removal of 2 ton bundles of sheet steel. An electric hoist and a Windsor sheet grab are used.

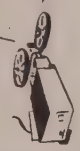


Polio patients are carried from dressing tables to exercise pool on Monorail system which includes a hand operated lowering device for easy operation by the nurse.



This twin-bridge 5 ton crane is 160 feet long operating on 9 runways. Two carriers, each centered between a pair of crane trucks, can make a lift of 10 tons as shown.

Fruit, unloaded from cars on special trolley racks, rolls around MonoRail curve to a drop section where the racks are lowered to basement tracks. The racks then roll by gravity to ripening rooms.



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Kramer, is that size and shape of the steel specimen cause variations in the results obtained in the rotating beam fatigue test, whereas size and shape do not influence the results obtained when using the axial load type of test. A rational interpretation of the results obtained with the different tests is being sought.

Another finding is that quenched and tempered steels have higher endurance limits than normalized or annealed steels when working with notched specimens. This is important, says Mr. Kramer, because many structures have stress concentrations which constitute a notch even though a physical notch is absent. There is no apparent correlation between the notch sensitivity in the Charpy impact test and the notch sensitivity in the fatigue tests.

Another significant finding is that fatigue life of steel can be changed markedly by intermittently interrupting the fatigue test in order to give the specimen a heat treatment at elevated temperatures. It was found that the use of such rest periods at temperatures below the recrystallization level increased the fatigue life of the steels tested. These were SAE 4340 and SAE 1045; the increase in fatigue life was more pronounced for the former than for the latter. Many practical applications are expected from this discovery in order to increase the service life of steel parts; for example, life of steel axles could be lengthened by heat-treating them with electric heating pads.

Geometry Plays Role—Geometry has been found to play an important role in determining what fatigue results may be obtained from a test specimen. Round specimens gave fatigue limits 8 to 10 per cent greater than obtained with square specimens of the same steel.

Some difficulty is being encountered in the search for a method of separating ductile from brittle steels. The study is based on axial tension impact tests to determine the temperature range within which the fracture in steel changes from a fibrous ductile break to a brittle break. It has been found that the transition temperature is sharply affected by the initial energy of the hammer, and the transition temperature may be changed by varying the initial energy. For example, a plain carbon steel's transition temperature was changed as much as 50 degrees F by increasing the initial energy of the hammer from 45 to 220 foot-pounds. Inasmuch as the transition temperature often is used to measure the toughness of a steel, or its suitability for low temperature service, the determination of the transition temperature is of extreme importance. The problem is not simple, says Mr. Kramer, because the amount of change in the transition temperature as a function of the initial energy is not the same for all steel, nor is it the same even for steels of the same SAE number.

Ten Foundry Groups Named

TEN subcommittees of the Munitions Board's Foundry Industry Advisory Committee have been found necessary to represent all sectors of activity in this industry from the standpoint of potential military mobilization. The subcommittees and their chairmen are:

Aluminum and magnesium castings: O. L. Earl, Acme Aluminum Foundry Co., Chicago.

Brass and bronze castings: E. W. Horlebein, Gibson & Kirk Co., Baltimore.

Cast armor plate: A. J. McDonald, American Steel Foundries, Chicago.

Cast iron pressure pipe and soil pipe: Brig. Gen. (retired) Donald Armstrong, U. S. Pipe & Foundry Co., Burlington, N. J.

Foundry equipment: T. Kaveny Jr., Herman Pneumatic Machine Co., Pittsburgh.

Foundry supplies: F. R. Fleig, Smith Facing & Supply Co., Cleveland.

Gray iron castings: W. L. Seelbach, Superior Foundry Co., Cleveland.

Malleable iron castings: C. L. Carter, Albion Malleable Iron Co., Albion, Mich.

Steel castings: F. K. Donaldson, Machined Steel Casting Co., Alliance, O.

An additional subcommittee, on foundry technical problems, is still to be organized.

Chairman of the Foundry Industry Advisory Committee is Frank G. Steinebach, editor, *The Foundry*, Cleveland. The Munitions Board's liaison officer is Lt. Col. F. H. Holmes.

Industrialist Take Commerce Jobs

IMPORTANT jobs in the Department of Commerce which require a knowledge of industry are being filled increasingly from the ranks of executives who retire under company pension plans. Latest addition is T. J. Maloney who recently retired after many years as traffic manager of the International Harvester Co.; he now is chairman of the executive committee of the Federal Inland Waterways Corp. Another recent addition is A. A. Wagner who recently retired from Jones & Laughlin Steel Corp. and now heads up the handling of steel allocation programs in the Office of Industry Cooperation. Another is A. W. Mace who supervises the handling of steel allocations by the OIC for requirements of the military services; Mr. Mace recently retired from Allegheny Ludlum Steel Corp.

Renegotiation Rules Drafted

FIRST two parts of the new joint Military Renegotiation Regulations to carry out the Renegotiation Act of 1948 have been completed by the National Military Establishment. These two parts, numbered 421 and 422, make it clear that contractors are subject to renegotiations only when total sales to the government in any year exceed $100,000; that contracts for less than $1000, even though there may be a large number of these, are not renegotiable; and that a number of special types of contracts are exempted entirely from renegotiations by the act.

Part 422 contains specific rules for the protection of information furnished by contractors for renegotiation purposes, and provides the contractor with the right of review by the National Military Establishment's Policy and Review Board, and with the right to appeal to the Tax Court of the United States.

These two parts are the first of a total of eight parts which will cover all phases of renegotiation. Until such time as they are all completed, and the complete Renegotiation Regulations published in one booklet, the Federal Register must be referred to by contractors who want to consult the regulations as they are released. Parts 421 and 422 appeared in the Federal Register of Dec. 29, 1948.

Protest Ruhr Dismantling

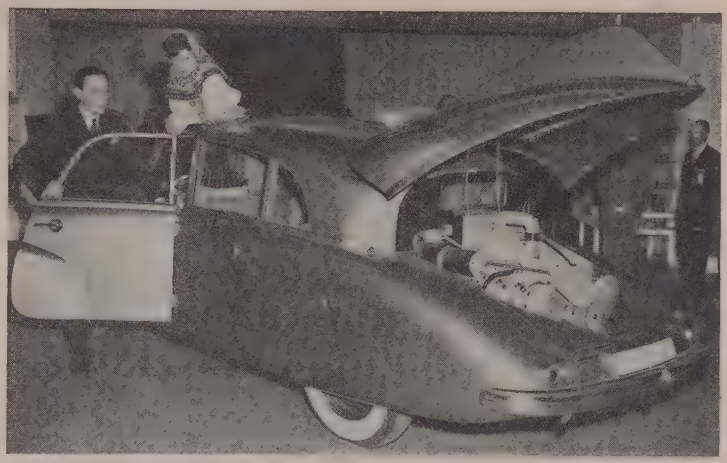
PROTESTS over the decision to dismantle steel plants in the British zone of Germany have been heard on a number of occasions in Congress. Rep. Robert F. Rich (Rep., Pa.) said the output of those plants is needed for European reconstruction and "we act like a bunch of boobs in permitting it to be torn down." Rep. Francis Case (Rep., S. Dak.) said: "It just does not make sense for the United States to contribute to the destruction of these plants and then call upon the taxpayers here to ship steel to western Germany, thus creating a steel shortage in this country—and then propose to remedy this shortage by using money from the taxpayers to build new plants here."

More European Autos

British, German makers set metalworking pace. Italian, Portuguese projects spur industry

STEADILY improving automobile production gives promise of pacing 1949 metalworking output in Britain and Western Germany. Elsewhere in Europe, ambitious Italian and Portuguese construction programs may forecast greater industrial activity. The construction includes power generating projects.

In Brazil, too, U. S. credit has been granted to continue a power expansion program designed to boost industrialization.



CZECH REAR-ENGINE CAR: The Tatra, new Czech 8-cylinder luxury car with rear engine, is shown at the Czechoslovak Industries Fair at the Museum of Science and Industry in New York. Vladimar Outrata, Czech ambassador to the United States, is inspecting the auto. NEA photo

Great Britain

PROMISING feature of British industry during 1948 was the production record achieved by auto makers which enabled them to export as never before in history. Nearly 22,000 British cars were shipped to America during the first 11 months of 1948, compared with 41 exported to this country in the corresponding period of 1938.

English automobile manufacturers have also expanded since the war into production of agricultural machinery, particularly tractors. Exports of this item during the first nine months of last year totaled 47,000. The auto industry remains the major consumer of steel in the United Kingdom.

British steel works turned out 14,877,000 tons of steel ingots and castings in 1948, exceeding the target by 377,000 tons and the production in 1947 by 2,153,000 tons. Expansion programs visualize an eventual capacity in the early 1950s of about 18 million tons. Iron and steel exports during 1948 are estimated at about 2 million tons.

The recent improvement in coal production has been maintained, and 1947 coal production has been exceeded in 1948 by over 11 million tons, bringing the total output to an estimated 208,418,500 tons during the past year. Coal exports totaled more than 16 million tons and exceeded the target comfortably.

Despite the excellent 1948 record, the government estimates that the U. K. must, by 1952, produce 13 per cent more than was done last year. The government plans a capital expenditure of about $8 billion over the next four years to boost coal and steel output; to increase the electricity generated by nearly a half; and generally to recondition and modernize Britain's basic industries.

Research and development is another activity being encouraged by the government. A recent survey by the Federation of British Industries shows that U.K. industry is now spending $120 million a year for this purpose. This sum is apart from direct government grants for research, which will amount to $92 million during 1949.

Britain is also encouraging new industries or is fostering expansion of activities in the old. The chemical industry, for example, is working on projects which will reduce the need to import large quantities of organic chemicals and plastic materials from North America. The industry will spend over $800 million on plant expansions by 1952.

Western Germany

THE VOLKSWAGEN, or People's Car, is Western Germany's major automobile at present. About 19,220 were produced in 1948, against 8940 in 1947. Present plan calls for production of 40,000 in 1949.

The maker intends to double output by increasing its working force by only 12 per cent. Productivity has climbed considerably in the past year. Twelve months ago it took 198 hours to produce one unit; 148 are now required. Exports will be promoted as much as possible, and the car will be shown at all foreign exhibitions, including a show in New York in April. Last year 4500 units were exported; the present quota is 800 a month.

The current price of about $2000 will be reduced eventually, the manufacturer predicts. Economy of operation and utility have been the main selling points thus far. The machine has an air-cooled engine and it has room for four people and luggage.

Auto-Union, formerly the largest German maker, has shifted its headquarters from Chemnitz in the Soviet zone to Ingolstadt in the U.S. zone. The company will resume production of motorcycles by spring and of its DKW car by the end of 1949. Riedel-Motoren Ltd., Immenstadt, U.S. zone, has begun production of a light motorcycle which can travel 120 miles per gallon of gas.

The metalworking industry's activity is outstripping the steel supply despite the fact that Bizonia's pig iron production increased from 493,900 metric tons in November to 514,483 tons in December. Raw steel output climbed from 599,400 to 611,776. For the entire year, pig iron production amounted to 4,610,000 tons, against 2,260,000 tons in 1947. Steel production rose from 2,950,000 tons to 5,370,000 tons. Coal output is also developing favorably; 8.1 million tons were mined in December. Domestic plants have the best stocks on hand since before the war, although this is accounted for largely by the fact that the low level of the Rhine has prevented the customary exports.

The Industriebank AG has been established in Dusseldorf as a co-operative financial agency to aid industries. Its organization will be similar to the Deutsche Industriebank which was established 20 years ago

in Berlin, and its chief function will be to extend long-term loans to industry.

Italy

AGREEMENT on the release of 20 billion lire (approximately $35 million) from the Italian counterpart fund for use in reconstruction projects in southern Italy has been announced by Economic Cooperation Administration.

The funds being spent are lire deposited in Italy as counterpart to the dollar grants being provided by ECA under the European Recovery program. Outstanding among the projects being undertaken is the completion of a drydock at Naples for which 1.5 billion lire was granted. The drydock is expected to be the largest in the Mediterranean when it is completed in about two years.

Naples will also benefit from the allocation of 1.3 billion lire for the construction of a petroleum dock which will enable tankers to unload into pumping stations which will send the oil into refineries being built in Naples by private companies. Other projects include highway construction, aqueducts and municipal buildings.

Portugal

PORTUGAL is embarking on an industrialization program, the basis for which will be hydroelectric power. Four dams have already been started in the northern and central part of the country, and others are planned.

British manufacturers will supply the cableways, crushing plant and central mixing plant for the Zezere dam, a 500,000 cubic meter concrete project. A Swiss firm is actually constructing the dam. The Venda Nova dam will be erected by a Portuguese contractor. Neyret Bellier, Grenoble, France, and Blaw-Knox Co., Paris, will manufacture the equipment and the steel forms.

Portugal believes that considerable expansion in its shipbuilding, food processing and farm equipment industries will eventually be possible as the result of increased electric power.

Brazil

EXPORT-IMPORT Bank of Washington has authorized a credit of $8,278,000 to 12 of the operating subsidiaries of the American & Foreign Power Co. in Brazil.

The credit is to be used to finance the purchase of U. S. materials, equipment and service required for the continuation of a program of expansion of electric power generating and distributing facilities initiated by the companies after the close of the war.

In the three years, 1945-47, the companies themselves invested $25 million in the construction of new facilities. Continued expansion is required in order that they may meet the current demands for power from industry and agriculture.

Under this power program, installation of 61,220 kw generating capacity and associated transmission and distribution facilities is planned. Of this total, 48,000 kw, or 78 per cent, will be hydroelectric.

Steel Exports Skid

Shipments for first 11 months of 1948 more than 2 million tons below year ago totals

EXPORTS of semifinished and finished iron and steel products during the first 11 months of 1948 totaled 3,931,870 net tons and represented a decline of more than 2 million tons from the shipments in the corresponding period of 1947, according to the Commerce Department. November ferrous exports also declined considerably from the October aggregate with the total for the latest month being 227,106 tons as compared with 326,918 tons in the preceding month.

Decreases in shipments were effected in all the major categories except seamless and welded casing and oil line pipe which reached an 11-month total of 341,975 tons, almost 50,000 tons higher than in the corresponding period in 1947. Ingots, blooms, billets, slabs and sheet bars decreased to less than 50 per cent of the year ago figure for the greatest percentage decrease in any classification, while fabricated and plain structural shapes made the largest tonnage decrease, from 702,233 tons to 415,372 tons.

Tonnagewise, tin plate and tagger's tin continues to lead the list of iron and steel exports. For the 11-

U.S. EXPORTS OF IRON AND STEEL

(Net Tons)

	November	Eleven Mos. Total—1948	Eleven Mos. Total—1947
Semifinished and Finished Products:			
Ingots, blooms, billets, slabs, sheet bars	7,272	202,879	454,371
Wire rods	975	35,257	65,100
Skelp	4,910	52,970	64,065
Iron bars	174	3,471	34,302
Concrete reinforcement bars	5,419	117,939	230,736
Steel bars, cold finished	2,665	42,387	97,951
Other steel bars (excluding alloy)	14,277	274,095	497,473
Alloy steel bars	1,703	50,350	191,773
Welding rods, electric	708	13,982	13,120
Boiler plate	905	26,957	31,339
Other plates, not fab.	14,247	291,985	498,983
Plates, fab., punched or shaped	1,400	22,046	33,175
Iron sheets, black	943	16,263	28,642
Steel sheets, black	29,431	370,521	518,332
Galvanized sheets	3,778	55,956	69,431
Strip steel, cold-rolled	4,591	53,170	81,978
Strip steel, hot-rolled	4,721	62,608	98,452
Tin plate and tagger's tin	32,428	539,368	541,730
Terne plate (incl. long ternes)	462	8,051	11,328
Structural shapes, plain	23,408	415,372	702,233
Structural shapes, fab.			
Frame and sashes	1,255	34,954	35,048
Sheet piling			
Rails, 60 lb per yard and over	19,612	271,246	442,954
Rails, less than 60 lb per yard			
Rails, relaying			
Splice bars and tie plates			
Frogs and switches	3,472	66,285	145,155
Railroad spikes			
Railroad bolts, nuts, and washers			
Car wheels, tires and axles	1,704	35,521	83,862
Seamless black pipe	1,106	18,867	17,065
Seamless casing and oil line pipe	12,465	341,975	292,374
Seamless boiler tubes	1,911	35,014	61,997
Welded black pipe	3,547	54,576	85,898
Welded galvanized pipe	2,791	36,551	64,516
Welded casing and oil line pipe	*	*	*
Welded boiler tubes	*	*	*
Other pipe and fittings	4,821	62,229	92,850
Plain wire	5,612	66,704	76,364
Galvanized wire	2,687	45,317	90,924
Barbed wire	1,875	35,294	70,025
Woven wire fencing	985	9,977	11,341
Woven wire screen cloth	315	5,135	5,396
Wire rope and strand	761	12,061	29,736
Wire nails	1,236	17,669	24,036
Other wire and manufactures	1,762	38,226	47,525
Horseshoe nails			
Tacks	921	13,461	14,120
Other nails, incl. staples			
Bolts, nuts, rivets and washers, except railroad	2,305	50,092	43,651
Forgings	1,524	24,536	32,312
Horseshoes	22	553	884
TOTAL	227,106	3,931,870	6,032,547

* Included with seamless.

Source: United States Department of Commerce.

month period 539,368 tons have been exported, slightly below the 541,730 tons shipped in the corresponding 1947 period.

Canada Seeks More Dollars

U. S. tariff structure cited as obstacle to solving exchange problems

PROMPT settlement of the exchange problems which have beset Canada recently must be made if the mutually profitable trade between that country and the United States is to regain its prewar pattern. This was emphasized recently by the Honorable Douglas Abbott, Canadian Minister of Finance.

"The wide disparity in our trade balance with the United States, on the one hand, and with the United Kingdom and the Commonwealth, on the other, is the hub of our trade and exchange problem today," Mr. Abbott said. He pointed out that the United States sold Canada $2 billion of exports in 1947, or almost 80 per cent of Canada's imports, while the United States purchased from Canada less than $1 billion of goods, or about 37 per cent of Canada's exports. About 50 per cent of Canada's exports goes to the United Kingdom and the Commonwealth.

Dollar Exchange Lacking—Before the war free convertibility of sterling permitted an easy solution of the Canadian dollar deficit with the United States. Due to widespread devastation in Europe, Canada can no longer pay for her deficits in the United States by surpluses earned elsewhere.

When Canadian exchange reserves declined from about $1½ billion at the end of 1945 to $500 million by November, 1947, a temporary program of trade restrictions was put into effect. "The program is aimed at solving the dollar problem . . . by increasing production and exports to the dollar countries," Mr. Abbott said.

Exports to U. S. Increase—Continued success of the program depends on what the United States does to facilitate purchases from Canada, he continued. "In the first nine months of 1948 we reduced our adverse merchandise trade with the United States from $720 million to $267 million. This has been achieved in part by expanding our exports to you from $759 million to $1067 million. To a lesser extent we have reduced imports from the United States during the period from $1468 million to $1324 million. . . . Thanks to the Marshall program, the United Kingdom and western Europe have been able to pay Canada in dollars for a substantial portion of our exports to them. . . . It has been possible to put a stop to the drain on our gold and dollar reserves," Mr. Abbott said.

Despite this improvement, a much closer balance in Canadian trade with the United States must be achieved to solve the basic trade and payments problem, he said. One of the chief obstacles to increased exports of Canadian goods to the United States is the latter's tariff structure. Mr. Abbott expressed the hope that the United States will be prepared to import on a much larger scale than at present.

SMOKE TEST: Fisher Body engineer applies the smoke test to a new model to check for air leaks. The machine at upper left creates a vacuum inside the car and the engineer by passing the smoke torch around window and door openings can quickly determine if there are leaks

AISI To Meet May 25-26

AMERICAN Iron & Steel Institute will hold its 57th general meeting in New York at the Waldorf-Astoria May 25-26.

Technical sessions will be held on the first day, and the second day will be devoted to the general session. Featured at the technical meeting will be the Schwab Memorial Lecture. Attendance at the various meetings will be limited to institute members.

The institute's meeting of chairmen and presidents of company members will be held March 30-31 and Apr. 1 at the Greenbrier, White Sulphur Springs, W. Va.

The institute's 1949 series of regional technical meetings is scheduled as follows: Sept. 29, Hotel Statler, Buffalo; Oct. 6, Hotel Drake, Chicago; Oct. 13, Hotel Pick-Ohio, Youngstown; Oct. 26, Hotel Thomas Jefferson, Birmingham; Nov. 2, Hotel Mark Hopkins, San Francisco.

Calendar of Meetings . . .

Jan. 24-25, Industrial Furnace Manufacturers Association: Meeting in Cleveland. Association headquarters are at 420 Lexington Ave., New York.

Jan. 24-28, American Society of Heating & Ventilating Engineers: Ninth international heating, ventilating and air conditioning show. International Amphitheatre, Chicago.

Jan. 27, Stoker Manufacturers Association: General meeting, LaSalle Hotel, Chicago. Association headquarters are located at 307 N. Michigan Ave., Chicago.

Jan. 31-Feb. 4, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute headquarters are at 33 W. 39th., St., New York.

Feb. 3-4, Electric Maintenance Engineers of Milwaukee: Tenth annual industrial electrical equipment exposition, Public Service Bldg., Milwaukee.

Feb. 7-8, National Association of Purchasing Agents: Mid-winter conference on public utility buying, Edgewater Beach Hotel, Chicago. Association headquarters are at 11 Park Place, New York.

Feb. 7-9, American Road Builders' Association: 46th annual meeting at Hotels Mayflower, Statler and Willard, Washington. Association headquarters are in the International Bldg., Washington.

Feb. 7-11, Automotive Accessories Manufacturers of America: Convention in Philadelphia. Association headquarters are at 501 Hardt Bldg., Philadelphia.

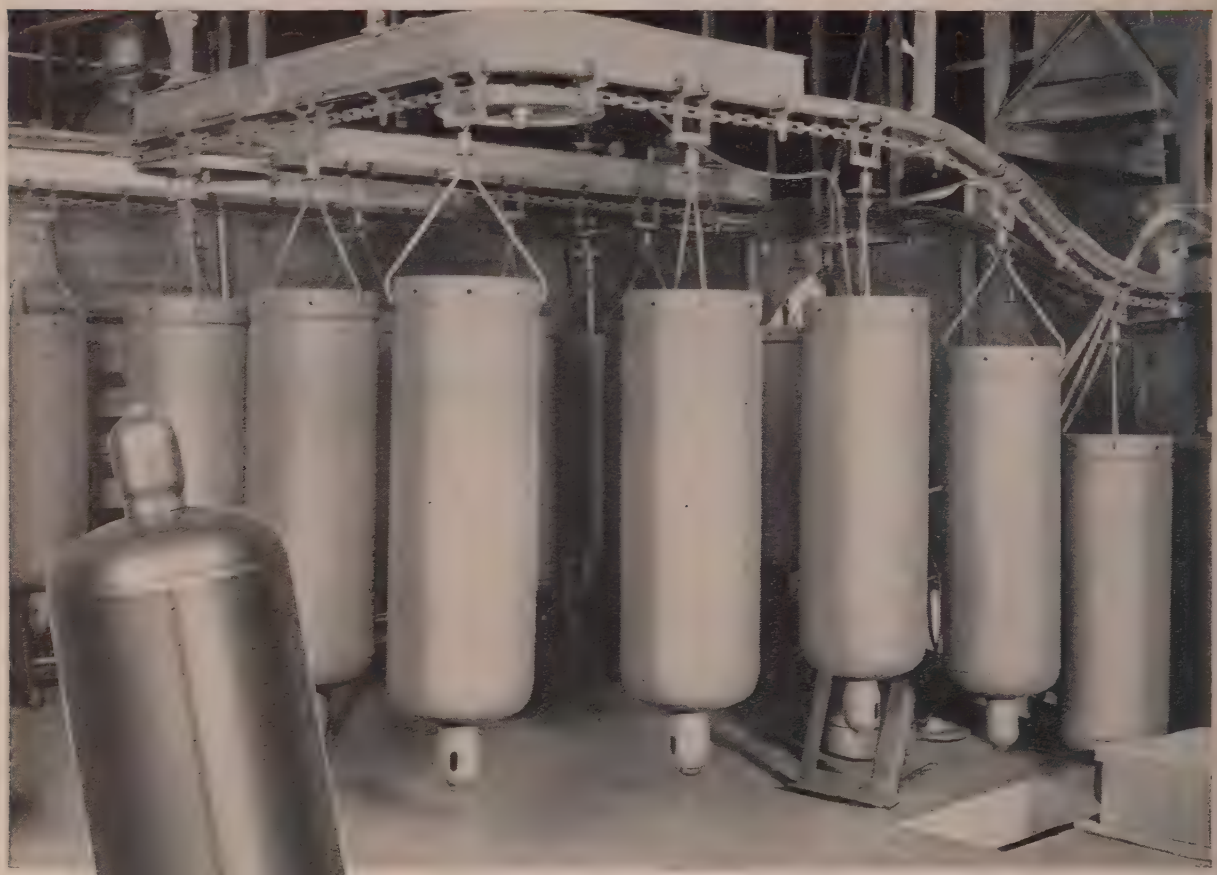
Feb. 13-17, American Institute of Mining & Metallurgical Engineers: General meeting, San Francisco.

Feb. 14-15, Edison Electric Institute: Convention at St. Louis. Institute headquarters are at 420 Lexington Ave., New York.

Feb. 21-22, Purdue University and Material Handling Institute: Materials handling conference on Purdue campus at Lafayette, Ind

N-A-X HIGH-TENSILE STEEL in L.P.G. Cylinders

means light weight with added safety and durability



Photographs of the Lee cylinder, courtesy of the Steel Cooperage Company, Detroit.

Because of the greater strength and excellent fabricating, welding and copper brazing properties of this low-alloy, abrasion- and corrosion-resisting steel, cylinders made with it (to conform to I.C.C. safety requirements) are 35% lighter in weight than when made with conventional carbon steel.

This weight reduction (with longer life) means greatly reduced shipping and handling costs . . . and over-all savings to consumers.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
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UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

New Chrysler models lack spectacular styling, place emphasis on engineering. Overall length reduced on longer wheelbase. Engine compression ratios higher

DETROIT

COMMON-SENSE engineering, as against spectacular styling, is what Chrysler Corp. aimed at in the development of its 1949 models of Plymouth, Dodge, DeSoto and Chrysler cars, and it backed up the program with an investment of $90 million for tools, dies, machinery and related equipment. That is a lot of money—about $1000 for every employee on the corporation payroll. The results were viewed by 400 press and radio representatives at the Chrysler Administration Bldg., and, probably because common sense is never particularly flashy or lurid, they came away interested but not too impressed. At least that is the consensus of a spot check of a number present.

Essentially what has been done in all four models is this: Lengthen wheelbases slightly but reduce overall length; increase body width somewhat but pull in overall width at fenders; lower car height but increase headroom; provide more legroom by reshaping dashboards; rehang rear doors so they hinge at the front; increase windshield area 24-37 per cent and windshield wiper coverage 44-61 per cent; step up engine compression ratios to 7:1 except in the Chrysler 8 which will be 7.2:1; improve brakes by using bonded instead of riveted linings; raise seats to near chair-height; revise ignition system to eliminate interference to radio and television; incorporate starter actuation into ignition switch.

Many Mechanical Improvements—These are the major changes, there are many other mechanical improvements, 50 according to President K. T. Keller. In addition a significant move has been made in the Plymouth and Dodge lines, pointing to the possibility that some time in the future, should the occasion demand, these divisions will be all set to offer a "low-price" model. The step involves introduction of a separate shorter-wheelbase chassis for each. The present Plymouth has 117-inch wheelbase and the 1949 regular series will have 118-inch, the economy size 111-inch. Dodge for 1948 has 119-inch wheelbase, for 1949 it will be 123 inches and 115 inches on the smaller version. Just how much a 7 or 8-inch reduction in wheelbase will trim off the price remains to be seen. Chrysler is not talking prices as yet. The conclusion is obvious, however, the shorter models have been evolved to drop into a price slot below the regular series should price become a serious talking point with the car-buying public. In this event, Plymouth and Dodge may well have a couple of aces in the hole which could give the competition pause.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,236	366,207
February	399,471	393,636
March	519,154	443,588
April	462,323	445,138
May	359,996	404,190
June	454,401	421,466
July	489,736	400,944
August	478,146	364,958
September	437,181	444,500
October	516,843	461,536
November	495,918	417,492
December	500,000*	492,819
12 mos.	5,535,405*	5,056,474

* Preliminary.

Estimate for week ended:

	1949	(same week) 1948
Jan. 1	81,968	65,573
Jan. 8	98,422	111,276
Jan. 15	108,329	109,031
Jan. 22	115,000	110,774

Ward's Automotive Reports

Dodge Offers Roadster — Dodge goes even further, with the introduction of a roadster body-type on its short wheelbase chassis. The roadster disappeared into limbo nearly a score of years ago and at the time it was one of the hottest jobs in the Chrysler line. On the hunch of Mr. Keller, conceived, so it is reported, while he was watching a hockey game, it has been resuscitated for Dodge. Top is of cloth, not power-operated but of the nostalgic "one-man" type. The old side-curtains of 1924 have been supplanted by plexiglass windows in frames which fit into sockets. Seats are of weather-resistant imitation leather.

The shorter Dodge line will be called the Wayfarers, the longer the Coronets, adding further to the rash of strange new names identifying various 1949 passenger car models, viz. . .the Kaiser Virginian and Vagabond, the Frazer Traveler, the Buick Riviera, the Pontiac Catalina, the Chevrolet Bel-Air, the Olds Holiday Coupe, the Plymouth Suburban.

Public Showing in March—Returning to the Chrysler models which, incidentally, will not be shown to the public until early in March although they are now in limited production and February schedules call for 50-60,000, inside comfort and ease in garaging and handling are aided by reducing overall heights from 1⅝ to 2½ inches and by reducing outside maximum widths from 1¾ to 3¾ inches, while at the same time maintaining increased headroom and widening substantially the windshields, seats and rear windows. Dashboards are curved on Chrysler and DeSoto, and on the right side are partially cut out on the under side to provide more knee room. The Chrysler dash also incorporates a leather-covered crash pad across the top.

Chrysler's semiautomatic transmission, in conjunction with fluid coupling, will be optional on Dodge for the first time this year, its availability on Plymouth is being deferred. The unit is essentially the same as that offered by Chrysler and DeSoto in the past, with the exception of a number of minor improvements and refinements.

Emphasizing Engineering — That Chrysler has laid the emphasis on "engineering"—a rather vague term which might better be interpreted in terms of comfort, convenience and ease of handling—is not surprising, in that the word has always been a fetish of the corporation since the day when the late Walter P. Chrysler first became associated with the engineering triumvirate of Zeder, Skelton and Breer. It has been a quarter of a century since these men first collaborated on a new high-compression engine.

Fred M. Zeder came originally from Studebaker, Owen Skelton from

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This is how the General Motors fast-back "A" body appears on the 1949 Chevrolet. Note the massive-appearing radiator grille and wrap-around bumpers, hitherto featured only on higher-priced passenger cars. Windshield is of curved glass; door handles of pushbutton type

the Packard designing rooms where he specialized on transmissions and axles, and Carl Breer from an apprenticeship with Allis-Chalmers. Their first assignment from Mr. Chrysler was to develop a new engine and car for Willys-Overland which Mr. Chrysler was managing for the banks before he joined Maxwell. When W. C. Durant bought the Elizabeth, N. J., plant in which they were working he got the prints on their car as well and it was eventually placed on the market as the Flint.

Later ZS&B joined Maxwell and started over again in Detroit. The memorable 6-cylinder Chrysler of 1924 was the result. Over the intervening years, technical progress and engineering development came to be synonymous with Chrysler.

Chevrolet Publicity Barrage

IF the world does not know by now that the 1949 Chevrolet has been announced, then there has been something wrong with the greatest barrage of advertising and publicity this manufacturer ever has unloosed at new model time.

The campaign reached its peak in the first postwar GM products show in New York, now running at the Waldorf-Astoria. The show is one of the most colorful extravaganzas ever staged by the industry and is estimated to cost more than $1 million. It features a revolving stage, a new rocket engine that revolves and separates in the middle, cutaway body sections showing how strength and weight saving are achieved at the same time, animated chassis, and many other novel exhibits.

The new Chevrolet line includes two series, both on 115-inch wheelbase—the Fleetline and the Styline—with two and four-door sedans of the fast-back type in the former and sedans of the notched-back type, plus coupe, convertible and station wagon, in the latter. Later will come a steel-top convertible, the Bel-Air. Chief departures from preceding models include a large increase in glass area, blending of front fenders into doors and partial absorption of rear fenders into the body, and lengthening, broadening and lowering of the passenger compartment. Direct double-acting shock absorbers are used front and rear, while the steering geometry has been changed to locate the master arm in the center of the chassis front end, minimizing "wheel fight" and "wander". Cowl vent has been eliminated, fresh air being drawn in through ducts located between the front fender skirts and the radiator. Instrument dials are grouped in a circular cluster on the face of a jumbo-size speedometer. Starter is actuated by a button on the instrument panel.

Weight Reduced—Some decrease in weight has resulted from a 1-inch reduction in wheelbase and a slightly narrower frame, the latter being 4 per cent lighter. Other savings were effected in the front suspension and shock absorber assemblies, as well as in seat cushions where flat spring elements are substituted for the conventional coils.

Bodies, the General Motors "A" type, are of course entirely new. To provide a rigid base support, underbody cross members are welded to the body sills and the floor panel is welded to this framework. The floor is devised so the rear seat support and rear seat foot rest are actually formed into it. Reinforcements to support rear shock absorbers are welded not only to the floor but to the body sides and seat back gussets as well.

Cross member of the front suspension, illustrated here last week, is unique, having a semicircular cross section and a nearly flat cover plate. The center section curves forward to support the engine while outer ends sweep to the rear to serve as front suspension mountings. Bending stiffness has been increased 15 per cent, while weight of the entire suspension assembly has been cut by 12 per cent.

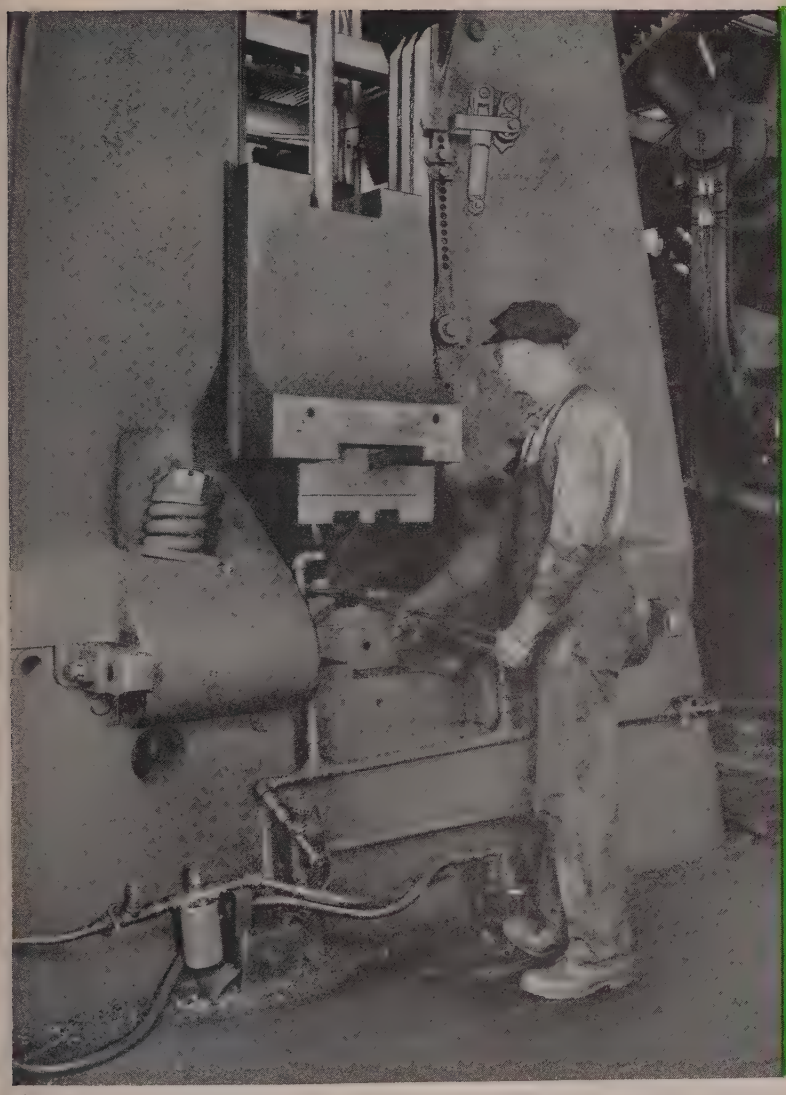
Other Details—Leaf spring rates at the rear have been reduced 6 per cent. . .increase of 70 per cent a minute in filling rate of the fuel tank results from installation of a ½-inch vent pipe at the top of the tank which taps back pressure . . . . . tires are 6.70x15 low-pressure type . . . .molded plastic seals replace rubber caps at the distributor end of spark plug wires. . . .rear tread has been reduced 1¼ inches, front ⅝-inch. . . .bodies are 2½ inches lower to a loaded overall height of 63⅝ inches. . . .flywheel tooth chamber is eliminated as an aid to durability . . . .front engine mounts are changed to control horizontal movement, curbing clutch chatter buildup . . . rear bumpers are recessed into the body and both front and rear bumpers are of wrap-around type.

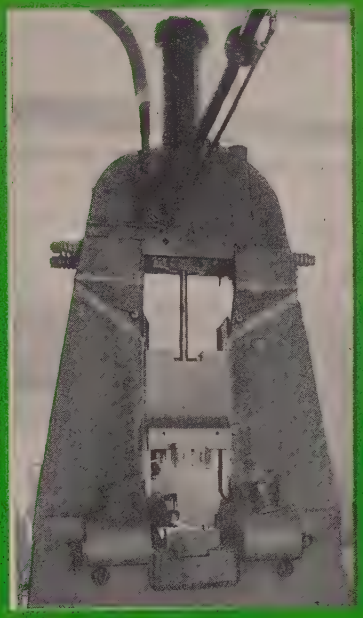
Record Western Output for GM

PRODUCTION of Buick-Oldsmobile-Pontiac cars during 1948 by General Motors' South Gate, Calif., plant was the greatest in its history, totaling nearly 70,000 units. Previous peak was 67,000 units in 1941.

May Repossess Tucker Plant

FEDERAL government has indicated it will take steps to repossess the Chicago plant of Tucker Corp. on Feb. 1 if the $125,000 installment on rental is not paid by that time, despite a court stay on bankruptcy proceedings against Tucker until March 3. Meanwhile Otis R. Radford, treasurer of the company and one of the two officers whose $12,000 salary was permitted to continue during the stay in proceedings, submitted his resignation last week.





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Greater and Cheaper Production per Hour

Write for details on the Chambersburg Ceco-Drop, the new air steam lift, gravity drop hammer.

CHAMBERSBURG ENGINEERING CO. CHAMBERSBURG Builders of IMPACT Machinery CHAMBERSBURG, PENNA.

Central Steel Ups Output

Barium subsidiary increases ingot capacity and doubles plate finishing potential

CENTRAL Iron & Steel Co., Harrisburg, Pa., subsidiary of Barium Steel Corp., spent about $2 million in 1948 to increase substantially its ingot capacity and to double its plate finishing potential.

In the development and expansion of Central's steelmaking facilities, major projects included installation of three 96-in. shell cupolas producing hot metal for the refining furnaces, purchase of a 30-ton electric furnace and elimination of gas producers, formerly used in connection with open hearths, in favor of oil.

A new blooming and slabbing mill and improvements to existing mills will account for Central's doubled plate finishing capacity. The blooming and slabbing unit, complete with auxiliary equipment, is now being installed. The capacity of this unit is rated at 90 tons per hour. Ingots will be heated in a six-hole soaking pit serviced by two 15-ton cranes. A new 42-in. universal mill has been purchased for future installation. Two 4500 hp steam engines and necessary boilers have also been acquired.

Granite City Has Record Output

GRANITE CITY Steel Co., Granite City, Ill., produced 494,000 tons of ingots in 1948, 1 per cent more than in 1944, its previous all-time record year. Some 409,000 tons of steel were shipped in 1948, another all-time record. In 1947 the company produced 440,000 tons of ingots and shipped 345,000 tons of steel.

Benefits from a ten-year, $20 million expansion and modernization program largely accounted for the record performance, according to Hayward Niedringhaus, company president. Granite City operates the fifteenth largest steel plant in the United States, which includes government owned open-hearth facilities.

Malleable Castings Plants Expand

PRODUCERS of malleable iron castings spent more than $12 million dollars in 1948 for the improvement and modernization of malleable foundries, it has been announced by Lowell D. Ryan, managing director of Malleable Founders' Society, Cleveland.

A survey of the membership of the society reveals the expenditure of this sum by the 70 members of the society who operate 86 plants and produce approximately 85 per cent of the malleable iron castings made each year in the United States. The sum was spent for new machinery and equipment, plant modernization and research. Indications are that a slightly smaller amount will be spent in 1949.

Production of malleable iron castings during 1948 held at a high level, total output exceeding slightly that for 1947.

COPPER COILS FOR CYCLOTRON: One of 14 large copper coils for the University of Washington's new cyclotron is shown being wound on the university campus. Winding machine was constructed of war surplus materials to handle 53,000 pounds of bus bar supplied by Revere Copper & Brass Inc. The coils weigh 17 tons, are wound with 10 miles of 3-inch copper strips

U. S. Merchant Fleet Larger

PRIVATELY-owned American merchant fleet, as of Jan. 1, consisted of 1216 ocean-going vessels of 1000 gross tons and over, compared to 1003 such merchant ships a year previous, National Federation of American Shipping has reported.

Fleet growth in the past year has resulted from the addition of eight ships of 106,000 deadweight tons from new construction, and the purchase of 223 vessels of 3 million deadweight tons from the U. S. Maritime Commission. Net gain, after allowing for vessels sold, transferred abroad or scrapped, was 213 ships of almost 2.9 million deadweight tons. Today's fleet is 4 million deadweight tons greater than the fleet of 10.2 million deadweight tons in 1939. Greatest part of the increase arises from the tanker arm of the merchant marine, which increased about 2.7 million deadweight tons over the prewar level.

Use of government-owned ships fell sharply during the year. On Jan. 1, 1948, 1128 government ships totaling 11.5 million deadweight tons were being operated. Only 354 government vessels, totaling 3.5 million deadweight tons, were in use as of Jan. 1, 1949.

Air Force Fosters Small Business

UNITED STATES Air Force is doing big business with small business and wants to do more in the future.

In the period from May 19 to Nov. 30, 1948, the Air Materiel Command Headquarters, Dayton, O., awarded 1969 contracts valued at $28,015,433 to establishments employing less than 500. A total of 4016 contracts valued at $1,391,119,875 were let during this period. While the dollar volume disclosed in direct contracts to small business is only a fraction of the AMC total, Procurement Division officials estimate that a considerable percentage of major contracts was sublet to small business.

AMC has inaugurated a new system designed to increase small business participation in Air Force manufacturing. A small business firm may write to Commanding General, AMC, Wright-Patterson Air Force Base, Dayton, O., Attention: MOPPXS72, Source & Price Records, and ask to be registered. The firm will be sent a regular form for registration of data on the type of its products and related information.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Lustron Corp., Columbus, O., builder of prefabricated metal homes, has purchased stand-by LP-Gas facilities to insure against production interruption on natural gas curtailments. H. Emerson Thomas & Associates Inc., Westfield, N. J., installed the stand-by system.

—o—

Swift & Co., Chicago, has begun operations in its new industrial oil processing unit of the technical products plant at Hammond, Ind. Products from the plant will provide raw materials to industries manufacturing rubber products, textiles, lubricating compounds and other items.

—o—

Aldrich Pump Co., Allentown, Pa., manufacturer of reciprocating pumps for medium and high pressure services, has appointed Jesse W. Eakins Co. as a representative for the Detroit area.

—o—

A. O. Smith Corp., Milwaukee, reports that its subsidiary, Smith Meter Co., Los Angeles, has bought all manufacturing, sales and service rights to a gasoline dispensing pump manufactured by Neptune Meter Co., New York. No plant or personnel were involved in the transaction.

—o—

Northland Engineering Co., Appleton, Wis., maker of farm machinery, has purchased a building in Kaukauna, Wis., where an assembly plant will be set up. Northland will move to Kaukauna within the next three years.

—o—

Flood Co. has moved from Cleveland to Hudson, O. Firm manufactures Penetrol, a rust preventive, reinforcing reducer for paint and a vehicle for aluminum pigment.

—o—

Gerity-Michigan Corp., Adrian, Mich., producer of finished castings for the automotive, electrical and radio fields, has discontinued its Detroit operations, has sold its Detroit plant equipment and inventory to Doehler-Jarvis Corp. and is negotiating for the sale of the building. Doehler-Jarvis has agreed to provide Gerity-Michigan an adequate supply of unfinished die castings.

—o—

General Electric Co., Schenectady, N. Y., has formed a new Crystallography Division for the GE Research Laboratory. New division, to be headed by Dr. David Harker, will deal with problems of inter-atomic arrangement. Firm has also combined the wire and cable divisions of its apparatus and construction materials departments and transferred them to Bridgeport, Conn.

—o—

Cincinnati Machine Tool Co., Cincinnati, has acquired control of Carlisle Chemical Works Inc., Reading, O. Management and operations of the chemical plant will be continued.

—o—

Dravo Corp., Pittsburgh, has been awarded a contract to supply heating equipment for three buildings at Hammond, Ind., that were recently acquired by Libby, McNeil & Libby, food processors, as a warehouse and distribution center.

—o—

Niagara Alkali Co., New York, is constructing a plant at Niagara Falls, N. Y., for production of trichloroethylene, a solvent used as a degreasing and metal cleansing agent. The facility is expected to be in operation early this year.

—o—

Cooper Alloy Foundry Co., Hillside, N. J., manufacturer of alloy castings, has sold the precision casting facilities of Precise Castings Corp., a Cooper division, to Arwood Precision Casting Corp., Brooklyn, N. Y.

—o—

American Export Lines Inc., New York, has paid $5,252,628 to the Maritime Commission as repayment in full of an operating-differential subsidy received by American Export from the commission since Jan. 24, 1938. American Export's earnings were sufficient to make the repayment, as required in the Merchant Marine Act of 1936.

—o—

Rust Engineering Co. has moved its engineering, executive and administrative offices to a recently purchased building at 575 Sixth Ave., Pittsburgh.

—o—

Aerol Co., a subsidiary of Airquipment Co. and a producer of materials handling equipment, has moved its offices to 2820 Ontario St., Burbank, Calif. Manufacturing remains at 1823 E. Washington Blvd., Los Angeles. Airquipment Co. was recently purchased by Lockheed Aircraft Co.

—o—

Drake Steel Supply Co., Los Angeles, steel warehousing firm, has enlarged its office and warehouse at Fresno, Calif.

—o—

Detroit Gray Iron Foundry Co., Detroit, has acquired Oakland Foundry & Machine Co., Rochester, Mich., which becomes a subsidiary of the parent company. No personnel changes are planned, with the exception of the addition of J. H. Gardner, formerly with Marshall Furnace Co., Marshall, Mich., who will be vice president in charge of sales.

—o—

Headford Bros. & Hitchins Foundry Co., Waterloo, Iowa, producer of gray iron and nickel-chrome castings, reports net sales in 1948 exceeded $1 million for the first time in its history.

—o—

Massachusetts Institute of Technology, Cambridge, Mass., reports that a national competition is now open to choose ten executives from various business fields for a year of graduate study in the Sloan Fellowship Program for Executive Development at MIT.

—o—

Bureau of Mines has released a publication describing development of new methods for production of lightweight concrete aggregate from clays, shales, slates, coal-mine wastes and other mineral materials.

—o—

United Helicopters Inc., Palo Alto, Calif., has appointed Bakersfield Air Park, Bakersfield, Calif., as a distributor for helicopters in Southern California and southern Nevada.

—o—

National Electrical Manufacturers Association, New York, has published its 1948-49 movie guide to films of electrical significance.

—o—

Newhall-Marshall-Wood has been incorporated with offices at 30 Church St., New York, to engage in the purchase and sale of surplus, obsolete and scrap railroad freight and passenger cars and parts, railroad tank cars and parts, locomotives, etc. Principals are David Newhall, John S. Wood and Charles A. Marshall.

DEERE GETS PARK UNITS

CRUCIBLE Steel Co. of America has sold only the steelmaking facilities at its Park Works in Pittsburgh to Deere & Co., Chicago, and not the entire works as reported in STEEL, Jan. 17, p. 53. Deere purchased four open hearths and two electric furnaces which will be operated by Crucible.

The Business Trend

CONTINUED improvement from the year-end lull in industrial activity caused STEEL's industrial production index for the week ended Jan. 15 to advance 4 points over the level of preceding week and reach 171 per cent (preliminary) of the 1936-1939 average. Level for the latest week reported is 2 points higher than for the corresponding week a year ago.

AUTOMOBILES — Contributing materially toward this gain were increased outturn by the automotive industry where assembly lines producing new models swung into action and completion of inventory taking at some plants. The automobile builders produced 108,329 passenger cars and trucks in the week ended Jan. 15, about 10,000 units more than in the preceding week. A few of the builders have announced cutbacks in previously announced schedules, but the consensus of the industry is that availability of materials rather than demand will place a ceiling on output for 1949.

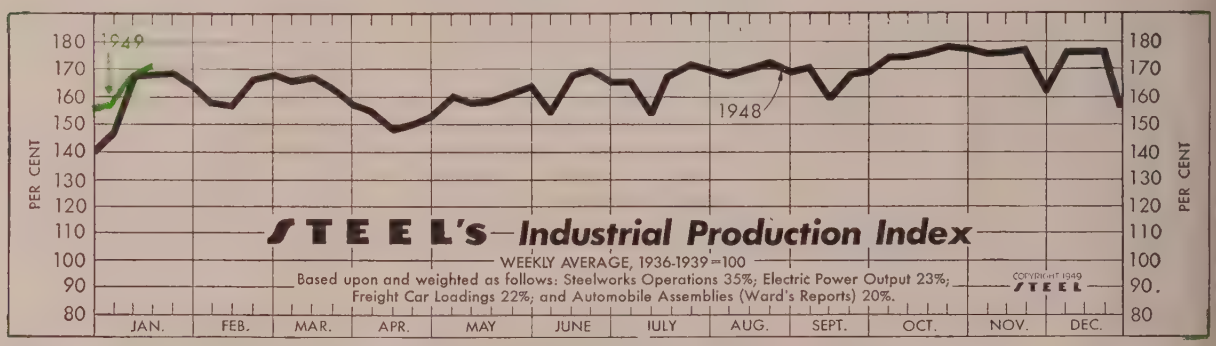
STEEL—Production of 1,830,600 tons of steel for ingots and castings during the week ended Jan. 15 also contributed importantly to the increased pace of industrial activity. Output for the week resulted in a new weekly production record by the nation's steelmakers as the industry continues all-out operations to satisfy, insofar as possible, the record demand for ferrous products.

CARLOADINGS—An estimate by the Shippers Advisory Boards that carloadings in the first quarter of 1949 would be 2.1 per cent above the 1948 level was not borne out in the first complete week of this year. According to the Association of American Railroads, loading of revenue freight in the week ended Jan. 8, totaled 721,507 cars or 13.2 per cent below the corresponding week last year.

COAL—One of the factors in lower carloadings is decreased output of bituminous coal. Production for the week ended Jan. 8 was 11,480,000 net tons, more than 2.3 million tons below the corresponding week in 1948. Continuing unseasonably warm weather throughout the eastern states has resulted in the growth of stockpiles to a postwar high despite the decreased production of the last few months.

INVENTORIES — Manufacturers' investment in inventories moved up by $350 million during November to a month-end book value of $31.2 billion, according to the Commerce Department. A little more than half of the rise was in the durable goods group, where the month-end value of inventories reached $14.5 billion.

TRUCKLOADINGS—Volume of freight transported by motor carriers in November dipped 4.7 per cent below the October total, but increased 13.4 per cent over November, 1947. Reports received by American Trucking Associations Inc. show that carriers transported an aggregate of 2,955,292 tons in November. Carriers of iron and steel moved about 4 per cent of total tonnage, a decrease of 0.6 per cent below October but an increase of 38.8 per cent over November of last year.



Index (chart above): Week ended Jan. 15 (preliminary) 171 Previous Week 167 Month Ago 176 Year Ago 169

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	99.0	97.5	99.5	98.0
Electric Power Distributed (million kilowatt hours)	5,727	5,742	5,790	5,370
Bituminous Coal Production (daily av.—1000 tons)	1,913	1,446	1,993	2,300
Petroleum Production (daily av.—1000 bbl)	5,428	5,454	5,645	5,326
Construction Volume (ENR—Unit $1,000,000)	$132.6	$124.5	$146.2	$83.3
Automobile and Truck Output (Ward's—number units)	108,329	98,422	123,315	109,031

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

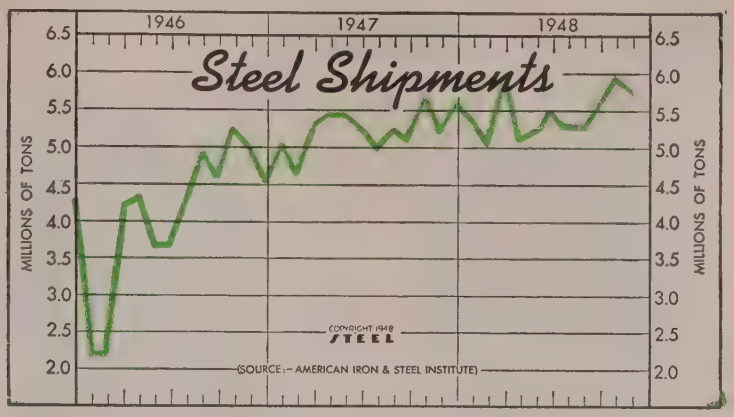
TRADE				
Freight Carloadings (unit—1000 cars)	730†	722	755	811
Business Failures (Dun & Bradstreet, number)	127	128	96	61
Money in Circulation (in millions of dollars)‡	$27,919	$28,151	$28,369	$28,374
Department Store Sales (changes from like wk. a yr. ago)‡	+9%	none	−1%	+8%

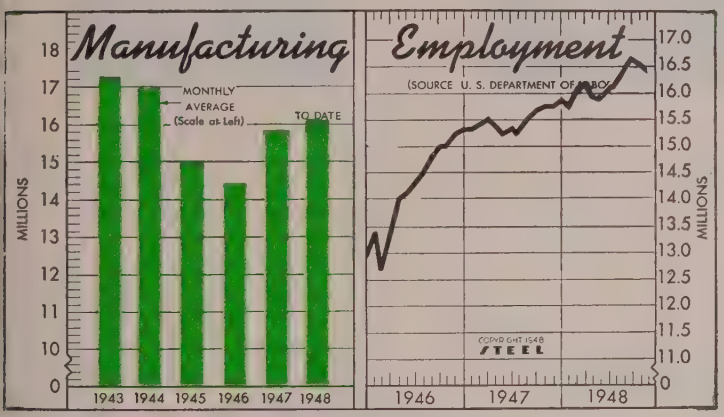
† Preliminary. ‡ Federal Reserve Board.

Steel Shipments
(Net Tons)

	1948	1947	1946
Jan.	5,410,438	5,061,333	2,189,369*
Feb.	5,046,115	4,626,424	2,189,368*
Mar.	5,978,551	5,304,415	4,213,913
Apr.	5,096,161	5,445,993	4,335,694
May	5,321,375	5,442,343	3,666,677
June	5,476,774	5,263,711	3,687,509
July	5,229,880	4,974,566	4,259,494
Aug.	5,329,060	5,278,223	4,965,456
Sept.	5,511,474	5,118,839	4,589,902
Oct.	5,952,008	5,681,597	5,260,832
Nov.	5,732,256	5,216,990	5,019,984
Dec.	.....	5,613,036	4,533,420

*Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,378,737.





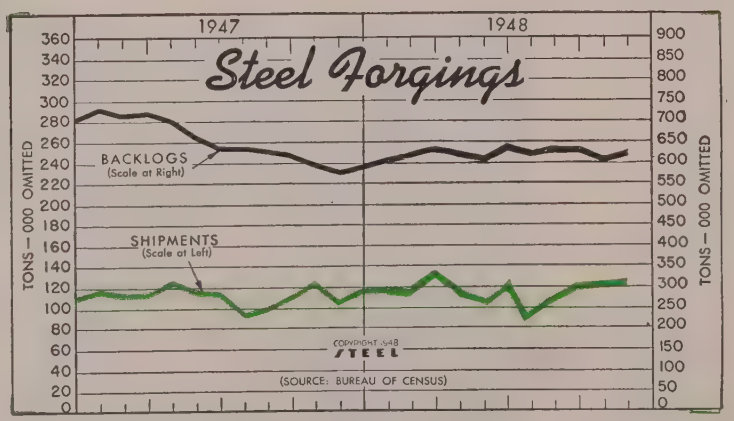
Factory Employment
(000 omitted)

	1948	1947	1946
January	16,267	15,372	13,499
February	16,183	15,475	12,751
March	16,269	15,510	13,433
April	15,950	15,429	14,054
May	15,904	15,569	14,159
June	16,115	15,672	14,371
July	16,158	15,580	14,526
August	16,441	15,962	14,876
September	16,683	16,175	15,035
October	16,576	16,209	15,064
November	16,403	16,256	15,271
December	.....	16,354	15,348
Monthly Ave.	.....	15,794	14,365

Steel Forgings
(Tons—000 omitted)

	Shipments*		Unfilled Orders*	
	1948	1947	1948	1947
January	118	116	618	723
February	117	111	631	714
March	131	115	641	717
April	114	121	628	699
May	109	116	624	663
June	120	112	641	639
July	97	92	627	631
August	111	98	634	626
September	121	109	631	617
October	123	124	605	594
November	124	104	621	586
December	...	117	...	594

* Forgings for sale.



	Latest Period*	Prior Week	Month Ago	Year Ago
FINANCE				
Bank Clearings (Dun & Bradstreet—millions)	$13,086	$15,045	$15,779	$13,262
Federal Gross Debt (billions)	$252.3	$252.4	$252.2	$256.5
Bond Volume, NYSE (millions)	$14.5	$16.1	$17.8	$32.4
Stocks Sales, NYSE (thousands)	4,085	5,339	5,479	4,617
Loans and Investments (billions)†	$62.6	$62.8	$62.6	$65.1
United States Gov't. Obligations Held (millions)†	$33,484	$32,987	$33,179	$37,642
PRICES				
STEEL's Composite Finished Steel Price Average	$97.77	$97.68	$95.50	$78.18
STEEL's Nonferrous Metal Composite‡	232.6	232.6	232.6	186.2
All Commodities†	160.5	161.3	161.7	166.8
Metals and Metal Products†	175.3	175.2	173.7	154.3

† Member banks, Federal Reserve System.

† Bureau of Labor Statistics Index, 1926 = 100. ‡ 1936 — 1939 = 100.

Men of Industry

A. L. HAWLEY

C. LEE EMERSON

JOHN D. SULLIVAN

A. L. Hawley, formerly assistant works manager, Plomb Tool Co., has been appointed works manager of the main factory in Los Angeles. He joined the company in 1936, working successively in the machine shop, tool room and engineering department.

—o—

J. Seton Gray has been elected chairman of the board of directors, Fuller Mfg. Co., Kalamazoo, Mich., and **E. L. Ludvigsen** succeeds Mr. Gray as president. **Harold E. Brey** was named executive vice president, and two new vice presidents are **William E. Niness**, appointed in charge of sales, and **Thomas Backus,** in charge of engineering. **Frank C. McManus,** formerly factory manager at Kalamazoo, has been named manager of the Transmission Division, and **E. L. Block** was appointed manager of the Unit Drop Forge Division.

—o—

Yarnall-Waring Co., Philadelphia, announces the following changes in its sales and manufacturing divisions: **Joseph Kildare,** sales manager, has been elected vice president in charge of sales, and **Frank W. Miller,** works manager, has been elected vice president in charge of manufacturing. **Carl Liberg,** formerly associated with the New York sales office, is now located at the new district office at Buffalo, and **C. V. Peterson** has been appointed sales representative in Cleveland.

—o—

Joseph A. Voelker, vice president, Pittsburgh Steel Co., Pittsburgh, has moved his headquarters from Pittsburgh to New York. He will co-ordinate sales activities of Pittsburgh's two New England subsidiaries, Johnson Steel & Wire Co. Inc. and Pioneer Steel Ball, and will supervise export and other sales of the company. **Carl L. Zak,** general manager of sales, will assume the active direction of sales of the company.

—o—

C. Lee Emerson has been appointed manager of rolled steel sales for Kaiser Co. Inc. He will have headquarters at Oakland, Calif.

—o—

Maynard B. Terry has been appointed vice president, American Brakeblok Division, American Brake Shoe Co., New York. He joined the company in 1943, and has been associated with the automotive equipment industry for nearly 20 years.

—o—

David S. Meiklejohn has been elected treasurer, International Cigar Machinery Co., New York.

—o—

Charles Percy has been elected president, Bell & Howell Co., Chicago, manufacturer of photographic equipment.

—o—

H. C. Larson, assistant metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa., has been appointed metallurgical engineer and secretary of plant committees dealing with the technical factors involved in steel plant operations.

—o—

Charles W. Carroll has been made vice president and sales manager, Haarmann Steel Co., Holyoke, Mass., succeeding **T. K. O'Connor,** deceased. **Harry L. Hunt** has been made contracting engineer, succeeding Mr. Carroll.

—o—

John W. Mowry has been elected president and treasurer, J. B. Booth & Co., Pittsburgh, after serving for 18 years with U. S. Steel Corp. He succeeds **A. B. Benney,** retired after over 40 years with the company.

—o—

John D. Sullivan, assistant director, Battelle Memorial Institute, Columbus, O., has been named chairman of a new division of the American Institute of Mining & Metallurgical Engineers, to be known as the Extractive Metallurgical Division, and organized to correlate metallurgical information on production and refining of nonferrous metals. **H. M. Shepard,** general manager, American Smelting & Refining Co., Baltimore, will be secretary of the division. Chairman-elect for 1950 is **Carleton C. Long,** director of research, St. Joseph Lead Co., Josephtown, Pa.

—o—

Mack Trucks Inc., New York, announces the following appointments: **J. E. Donovan,** district manager in charge of the San Francisco branch; **J. W. Biggins,** district manager of the Louisville branch; **H. J. Fikejs,** district manager of the Kansas City, Mo., branch; **T. J. Colter,** district manager of the Milwaukee branch; **A. P. Cowles,** district manager of the Springfield, Mass., branch; and **R. J. McGivney,** district manager of the Worcester, Mass., branch.

—o—

Combustion Engineering-Superheater Inc., New York, has elected **F. A. Schaff,** chairman of the board and vice chaiman of the executive committee; **Samuel G. Allen,** chairman, executive committee; **Joseph V. Santry,** president; **Martens H. Isenberg,** executive vice president; **Harold H. Berry,** vice president in charge of finance. Vice presidents are: **Wilbur H. Armacost, G. D. Ellis, A. J. Moses,**

WHY WELD, CLINCH OR STAKE NUTS?

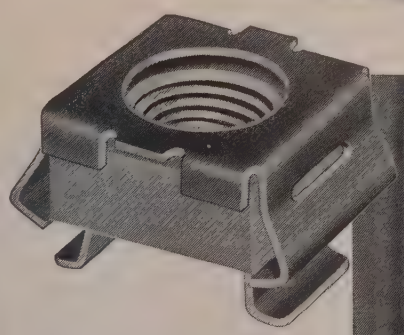
JUST SNAP IN Speed Grips*

Now you can attach square nuts to metal parts *by hand!* Just thumb pressure snaps the *new* SPEED GRIP Nut Retainers in place. SPEED GRIPS, like many SPEED NUTS, have spring steel "mechanical hands" that lock them in bolt-receiving position. They are ideal for blind assembly attachments because SPEED GRIPS do not have to be held with a wrench.

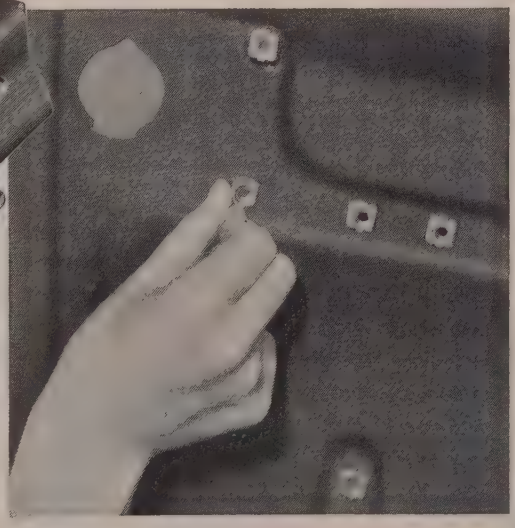
Developed as a companion item to the famous Tinnerman SPEED NUTS, the SPEED GRIP Nut Retainer gives all the self-retaining advantages of SPEED NUTS in applications requiring square nut attachments.

Write for the details on this latest Tinnerman development. The savings it can make in equipment investment in assembly steps, in material handling and in parts costs will surprise you. And ask your Tinnerman representative about our Fastening Analysis Service. Tinnerman Products, Inc., Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton
In England: Simmonds Aerocessories, Ltd., Treforest
In France: Aerocessoires Simmonds, S. A., Paris



New Tinnerman SPEED GRIPS are available in a complete range of sizes. Screw size and panel range are stamped on each fastener.



Here's how SPEED GRIPS can be applied to panels on the moving assembly line. In a few seconds, assembler can snap in self-aligning SPEED GRIPS . . . no extra handling . . . no special equipment required!

TINNERMAN Speed Nuts*

*Trade Mark Reg U S Pat Off

MORE THAN 4000 SHAPES AND SIZES

J. S. Skelly, O. W. Strauss, D. S. Walker, A. C. Weigel, and **Arthur Williams.** Secretary and assistant treasurer is **Irving B. Swigert.** Assistant secretaries are **T. F. Morris** and **Francis J. Dolan.** Assistants to chairman are **T. F. Morris** and **F. R. Fitzpatrick.**

—o—

Syntron Co., Homer City, Pa., announces establishment of several new district sales offices and promotions of the following sales personnel: **W. C. Leasure** of the company's general offices in Homer City has been promoted to district sales manager in charge of the new sales office in Houston, Tex.; **Nelson C. DeVilling,** formerly of the Pittsburgh sales office, promoted to new sales office as district manager at Dallas, Tex.; **Dick McHale** of the Chicago office, named district sales manager at Los Angeles; **James B. Barth** appointed to replace Mr. DeVilling at Pittsburgh and **G. R. Stocum,** succeeding Mr. McHale at Chicago; **D. E. Nugent** has been appointed to take over power tools sales in the Kansas City, Mo., office.

—o—

Joseph A. Neubauer has been appointed technical director for Columbia Chemical Division, Pittsburgh Plate Glass Co. and for Southern Alkali Corp., Pittsburgh. He has served as technical advisor to the Columbia Chemical Division since 1945.

—o—

Cleco Division, Reed Roller Bit Co., announces appointment of **B. O. Stoothoff** as special representative, located in Cincinnati. He will act as liaison between general sales office in Houston, Tex., and local dealer organizations.

—o—

Terry P. Cunningham has been appointed director of advertising and sales promotion, Sylvania Electric Products Inc., New York, and **Edward P. Atcherley** was appointed northwest division manager of renewal tube sales.

—o—

Dr. William L. Davidson, authority on atomic energy, has been named director, B. F. Goodrich Co.'s physical research department, located at Brecksville, O.

—o—

Glenn C. Shively has been appointed purchasing agent, Superior Steel & Malleable Castings Co., Benton Harbor, Mich.

—o—

Personnel changes in the Spring Mill & Rail Bond Division, South Works, Worcester, Mass., American Steel & Wire Co., are: **Raymond E. Tibbetts,** named division superintendent, succeeding **Harry F. Clarke,** resigned. **Harold J. Elmendorf,** appointed chief spring engineer, and **Erick R. Karlson,** named division supervisor—production planning.

—o—

New Wrinkle Inc. and Chadeloid Corp., Dayton, O., announce that **Robert F. Ohmer** has been elected president of both concerns. Before serving with the U. S. Army Air Force during the war, Mr. Ohmer was president of New Wrinkle Inc. Since the war he has been vice president in charge of administration, Hydraulic Press Mfg. Co., Mt. Gilead, O. Mr. Ohmer will establish the main offices of New Wrinkle Inc. in Chicago. The laboratories will continue at Dayton.

—o—

James Clarke, director of audits, Westinghouse Electric Corp., Pittsburgh, has been elected assistant controller of the company. **Dr. William E. Shoupp,** nuclear physicist, was named director of research, Atomic Power Division, and **Robert A. Bowman** was appointed manager of engineering for the division. **F. R. Benedict** has been appointed manager of the headquarters engineering departments of the corporation.

—o—

Dr. Kenneth H. Kingdon has been appointed assistant director, research laboratory, General Electric Co., Schenectady, N. Y. **Laurance I. Wood** was named assistant general counsel of the company. **A. R. Hines,** formerly manager, Apparatus Department office in Philadelphia, has been appointed manager of a separate sales district for Michigan, established by the Apparatus Department, with headquarters at Detroit. **V. J. Snyder** and **C. M. Dunn,** assistant managers of the Detroit local apparatus office, are appointed assistant managers of the new district. Operations of the wire and cable divisions of the Apparatus & Construction Materials Departments have been consolidated, and **B. F. Ilsley,** manager, apparatus wire & cable division, has been named manager of the expanded wire & cable division, with headquarters at Bridgeport, Conn.

—o—

T. J. Kauer has resigned as managing director, Wire Reinforcement Institute, Washington, to become director of highways for Ohio, with headquarters at Columbus.

—o—

Whiting Corp., Harvey, Ill., announces that **B. A. Hanner,** manager, distribution sales, has been made manager of its hoist sales department.

—o—

James S. Weaver has become associated with Culbert Pipe & Fittings Co., Jersey City, N. J., as special sales representative in the New York territory.

—o—

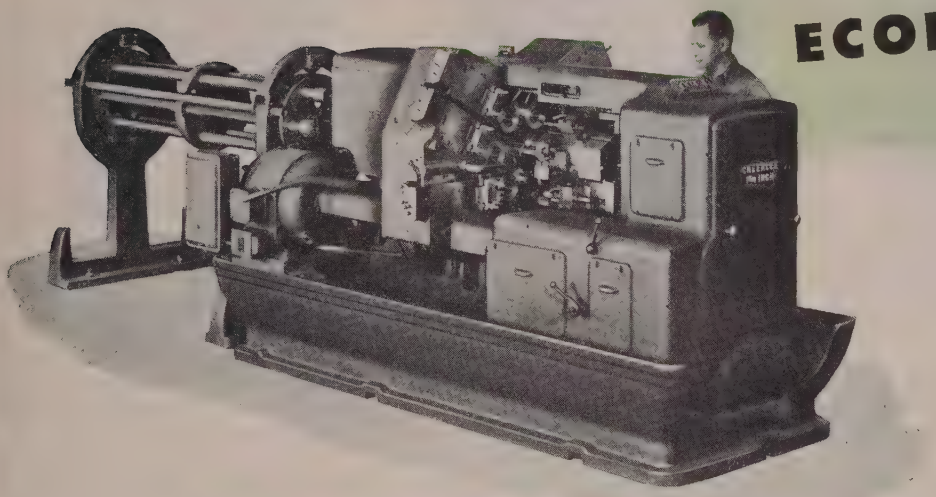
Eugene F. Murphy has been promoted from superintendent to works manager at the Dunkirk, N. Y., plant of American Locomotive Co. He suc-

JOSEPH A. NEUBAUER

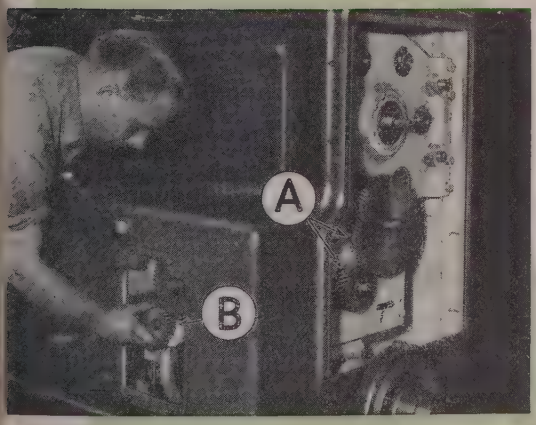
ROBERT F. OHMER

B. A. HANNER

Build a bigger, better business . . . **SHORT-RUN** *and* **LONG-RUN ECONOMY!**



WITH GREENLEE SIX-SPINDLE AUTOMATICS



QUICK CHANGE FEEDS *and* SPEEDS

(A) Easily-changed helical gears control spindle speeds.
(B) Splined pick-off gears allow quick changes in feeds. A wide range of speeds and feeds are available.

GREENLEE *Automatics are often called "The Operator's Favorite".*

Yours can be a bigger, better business when you put more of your jobs on GREENLEE Automatic Screw Machines. Quick change-over features of the GREENLEE make even *short* runs profitable. You save money by having short down-times between jobs.

Standardized tooling — another important GREENLEE feature — has cut equipment costs to a minimum without affecting the efficiency or range of work of the machine. Also, *built-in* threading drive and feed mechanism handles either right-hand or left-hand threading operations as well as tapping and reaming.

Set-ups are speedily made with standard, interchangeable cross slide cams and a greatly simplified method of setting the main tool slide stroke on a graduated worm wheel.

It's easy to see why operators like the GREENLEE . . . it has convenient height, a wide-open tooling area, and a built-in lighting system that permits making fine adjustments quickly and accurately.

Use the GREENLEE for higher efficiency, better economy, lower costs, and greater profits . . . on either short-run or long-run work.

GREENLEE

WRITE FOR MORE FACTS

Let us send you our complete 20-page book showing details of construction and operation of Greenlee Automatics. Ask for Screw Machine literature.

GREENLEE BROS. & CO., 1921 MASON AVE., ROCKFORD, ILLINOIS

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

ceeds **Herman Franck,** who will continue with Alco in a consulting capacity.

—o—

George E. McLaughlin has joined Tube City Iron & Metal Co., Glassport, Pa. He will represent the company in the Mahoning Valley and the East, and will have headquarters in Youngstown.

—o—

Hal M. Cranston has been appointed comptroller of Owens-Corning Fiberglas Corp., New York. He has been assistant treasurer and auditor.

—o—

Frederick G. Wacker Jr. has been elected president, and **Charles H. Wacker III** has been elected executive vice president, Ammco Tools Inc., North Chicago.

—o—

Leslie E. Bluhm has been appointed Milwaukee field engineer for Nelson Stud Welding Division, Morton-Gregory Corp.

—o—

Glenn E. Martin has been named manager of sales planning, Replacement Tire Sales Division, B. F. Goodrich Co., Akron.

—o—

Robert F. Edwards has been appointed section engineer in charge of synchronous motor & vertical generator section, Ridgway Division, Elliott Co., Jeannette, Pa.

—o—

Milo A. Nice has been appointed assistant manager, Explosives Department's technical service division, Hercules Powder Co., Wilmington, Del.

—o—

Robert E. Mauger has been appointed assistant of the pipe mill at the Indiana Harbor works of Youngstown Sheet & Tube Co., Youngstown.

—o—

Fred E. Link has been appointed general works manager, Oil Well Supply Co., U. S. Steel subsidiary, at Dallas, Tex.

—o—

Dr. Kent R. Van Horn has been named an assistant director of research, aluminum research laboratories, Aluminum Co. of America, Pittsburgh, and **Maurice W. Daugherty** was named chief of the Cleveland branch of the laboratories, succeeding Dr. Van Horn.

—o—

Edgcomb Steel Co., Philadelphia, has announced appointment of **J. B. Owen** as assistant manager of sales, and **V. M. de Castro** as assistant to the president.

—o—

Otto A. Pfaff, president, American

B. L. WISE

Wheelabrator & Equipment Corp., Mishawaka, Ind., was recently elected to the board of directors, Signode Steel Strapping Co., Chicago.

—o—

B. L. Wise, director of production, National Electric Welding Machines Co., Bay City, Mich., has been elected president, Resistance Welder Manufacturers' Association. He succeeds **T. S. Long,** vice president and general manager, Taylor-Winfield Corp., Warren, O., who was elected chairman of the executive committee. **T. Embury Jones,** president, Precision Welder & Machine Co., Cincinnati, was named vice president of the association. **George A. Fernley** and **H. R. Rinehart** were re-elected executive secretary and secretary-treasurer, respectively. They make their headquarters at the association's main offices at Philadelphia.

—o—

Benjamin Wolff & Co., Chicago and Milwaukee warehouse distributors of industrial metals, announces the following changes in personnel: **Burton S. Wolff** was elected president and treasurer of the firm, and **C. D. Engstrom,** former assistant to the vice president, was named vice president in charge of operations. **Jack May** was named vice president in charge of sales. **M. W. Young** was elected to secretary, and **Seymour Oseas** to assistant treasurer and assistant secretary.

—o—

Newly elected officers, York Corp., York, Pa., are **J. Keith Louden,** named vice president and assistant to the president; **J. G. Bergdoll,** vice president and works manager; **J. C. Consley,** vice president and chief engineer; and **William F. Lynne,** assistant controller of the company.

—o—

International Business Machines Corp., New York, has appointed **Edmund C. Thompson** assistant to the manager of customer engineering at New York.

—o—

C. O. Richards has been appointed general sales manager over all divisions of Standard Products Co., Detroit.

—o—

Roger S. Schofield has been placed in charge of transportation sales, Baldwin Locomotive Works, Philadelphia district office, succeeding **Walker H. Evans,** promoted to district manager.

—o—

Frank A. Luebbe, general sales manager of Nichols Wire & Aluminum Co., Davenport, Iowa, has also been appointed vice president of the company.

—o—

Binks Mfg. Co., Chicago, announces election of **Joseph D. Linehan** to fill a vacancy on the board of directors. Mr. Linehan is president, Continental Plastic Corp., Chicago.

—o—

J. T. Jones, recently with the open hearth department, South Chicago plant, Republic Steel Corp., has joined the sales force of Vesuvius Crucible Co., Pittsburgh.

—o—

Croft Steel Products Inc., Jamestown, N. Y., has appointed **Thomas H. Carter** as southern regional manager, with offices in Atlanta.

—o—

John S. Andrews, formerly with Republic Steel Corp., Rotary Electric Steel Co. and Bundy Tubing Co., has become associated with Zimmer-Lightbody Industries, Detroit, in sales of special and standard hexagon steel nuts for the automotive industry.

—o—

Edwin F. Bates, formerly works manager, Red Lion plant,Budd Co., Philadelphia, has been named plant manager, and **Lee N. Blugerman** has been named works manager.

—o—

George B. Horn, formerly secretary and assistant general manager, Wheeler Insulated Wire Co. Inc., Bridgeport, Conn., has been named vice president, and **George T. Mumaw,** formerly treasurer, has been named secretary-treasurer.

—o—

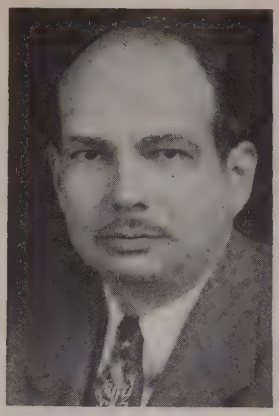
J. F. McRoberts has been appointed vice president and central regional sales manager, Independent Farm Industries, Chicago.

—o—

J. H. Gardner, formerly with Marshall Furnace Co., Marshall, Mich., has joined Oakland Foundry & Machine Co., Rochester, Mich., subsi-

CLARE C. BOSTEDOR

Appointed director, programming and production control, Lincoln-Mercury Division, Ford Motor Co., Detroit. Noted in *STEEL* Jan. 10 issue, p. 51



JOSEPH R. PARSONS

Has joined the research department of Harbison-Walker Refractories Co. as research engineer, Hays Laboratory, Pittsburgh. Noted in STEEL, Jan. 10 issue, p. 48

WILLIAM SEYMOUR JR.

Elected vice president in charge of plant operations and service for steel-service plants of Joseph T. Ryerson & Son Inc., Chicago. Noted in STEEL, Jan. 10 issue, p. 46

diary, Detroit Gray Iron Foundry Co. He will act as vice president in charge of sales.

—o—

R. E. Bromley has been appointed assistant to **E. Clyde Grimm,** vice president, Samuel G. Keywell Co. Inc. at Pittsburgh. He was associated for 27 years with Crucible Steel Co. of America in Midland, Pa.

—o—

Clifford W. Lord has been appointed vice president of United States Steel Supply Co., in charge of West Coast warehouses.

—o—

T. G. Harkins has been appointed superintendent of the open hearth department, Midland Works, Crucible Steel Co. of America, Pittsburgh. **O. T. Albaugh** was appointed superintendent, transportation department, of the works.

—o—

Bruce E. Horst has been appointed sales representative in the Rockford, Ill., territory for Barber-Colman Co.

—o—

A. H. Lundius has been appointed plant manager of the Hyatt Clark Township plant, near Harrison, N. J., of the Hyatt Bearings Division, General Motors Corp. He succeeds **J. C. Henny,** former plant manager, who retired Jan. 1.

—o—

Carl E. Von Luhrte has been promoted from sales manager, Western Division, to director of sales, Chicago Retort & Fire Brick Co., Chicago, and **Robert P. Stevens** has been promoted from sales manager, Eastern Division, to sales manager.

—o—

W. J. Edmonds has been named general traffic manager for Granite City Steel Co., Granite City, Ill. He succeeds **John B. Green,** who resigned to accept a position with another company. **M. F. Schweppe** has been appointed traffic manager.

—o—

L. Bushfield has been appointed sales manager, Range & Heater Division, Perfection Stove Co., Cleveland, succeeding **O. H. Larimer,** retired after 30 years' association. **C. C. West** succeeds Mr. Bushfield as manager, Atlanta district.

—o—

Francis J. Lantry has been elected president, M. H. Treadwell Co. Inc., New York, succeeding the late **J. Schuyler Casey.**

—o—

George L. Mitsch, assistant plant manager, St. Louis foundry, American Car & Foundry Co., has been appointed plant manager.

—o—

Leo E. Jacobs has been elected president, Titan Abrasives Co. Inc., Chicago. He formerly was executive vice president and director of Charles H. Besly & Co., Chicago.

—o—

C. S. Gotwals has been appointed quality manager of all SKF Industries Inc., New York. **Charles R. Scott Jr.,** in charge of Machining Division since 1946, succeeds Mr. Gotwals as superintendent. **W. F. Shedinger** will direct operations of the Machining Division in addition to his duties as head of the Ball Division.

OBITUARIES . . .

J. H. Morrison, 56, vice president and director, Pittsburgh Steel Co., Pittsburgh, died Jan. 18 at Youngstown. He formerly was vice president in charge of operations of Sharon Steel Corp.

—o—

Lewis E. Reisner, 46, founder and first president, Tennessee Aircraft Inc., Nashville, Tenn., died Jan. 9 of a heart attack.

—o—

William L. Stancliffe, 64, former vice president in charge of sales, American Car & Foundry Co., New York, died Jan. 16. He retired in 1944 but had continued as a consultant and board member.

—o—

Harry E. Schank, 58, authority on automotive engine cooling, and for 15 years chief engineer, McCord Corp., Detroit, died Jan. 12.

—o—

William R. Brennan, 48, plant engineer, Bethlehem Steel Co., at Beaumount, Tex., died Jan. 12 in that city.

—o—

Arthur E. Jackson, 45, president and treasurer, Jackson Steel Products Inc., Brooklyn, N. Y., died recently.

—o—

A. M. Anderson, chairman, Sisalkraft Co., Chicago, died Jan. 7.

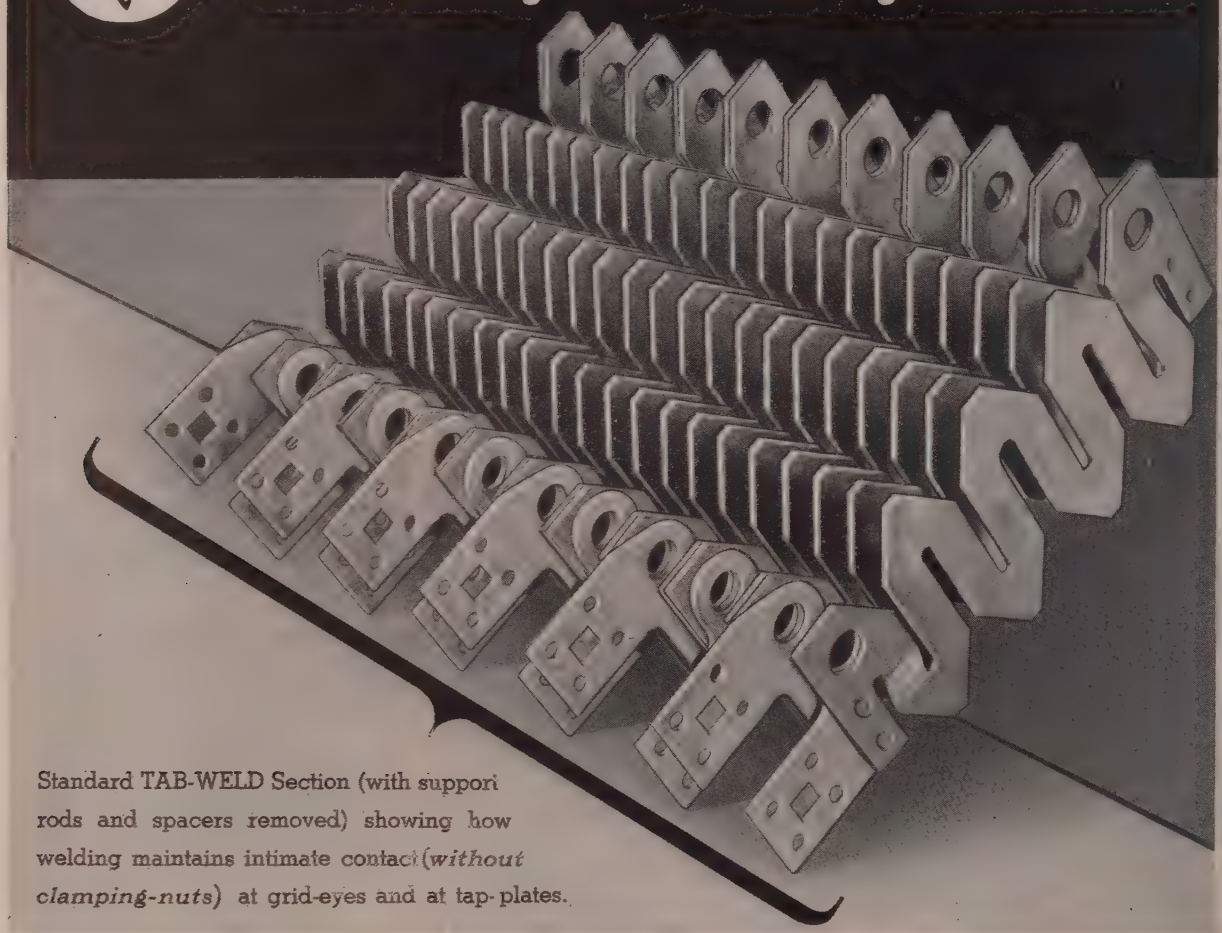
—o—

David P. Hopkins, 81, for many years before his retirement in 1943 vice president in charge of operations and director, United States Pipe & Foundry Co., Burlington, N. J., died Jan. 13.

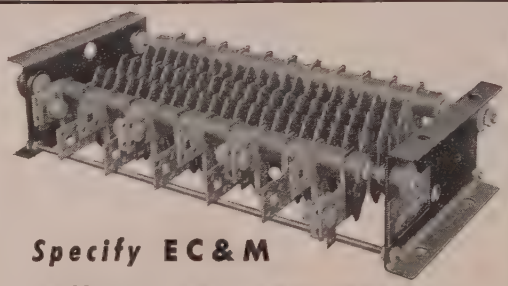
—o—

Charles C. Carr, 66, ordnance manufacturing expert, associated with R. K. LeBlond Machine Tool Co., Cincinnati, for 44 years, died Jan. 8.

TAB-WELD Resistors eliminate burning where burning would cause high maintenance



Standard TAB-WELD Section (with support rods and spacers removed) showing how welding maintains intimate contact (*without clamping-nuts*) at grid-eyes and at tap-plates.



Specify EC&M Bulletin 942 TAB-WELD Plate Resistors for D-C. Crane and Mill Auxiliary Control.

MANY users of electric motor control are switching to EC&M TAB-WELD Plate Resistors because welding stabilizes the resistance value of each section and reduces maintenance. Numerous taps, convenient for affixing external leads at the desired point, simplify the replacement program.

Mill sections have grids connected in series. Internally, each section has *all* grids of the same size. Uniform mounting-hole dimensions permit stacking sections easily. Use TAB-WELD Sections from the storeroom shelf "as is"—no tap shifting or other shop alteration when a field replacement is needed.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Engineering News . . . AT A GLANCE

SCIENTIFIC HEATING—Controlled atmospheres and electric furnaces are playing an ever-increasing role in the processing of metals for modern equipment. Development of controlled atmospheres, according to the *Westinghouse Engineer,* has turned the problem of heat treating metals into an exact science. Development and application of reacted fuel-gas atmosphere during bright hardening, for example, makes it possible to harden intricate machine parts without oxidation or decarburization of surfaces. Close control of surface conditions, which eliminates scale and soft skin on the piece, makes finish machining, grinding, cleaning, sandblasting or descaling unnecessary.

INHIBITS CORROSION— In Washington, the electrodeposition laboratory of the National Bureau of Standards reports development of chromated protein coatings offering a convenient, inexpensive means of protecting metals—especially zinc, iron, brass and aluminum. In applying a protective film, the metallic surface to be coated is first dipped in casein, albumin or gelatin, then impregnated with chromate which both hardens the film and inhibits corrosion.

MEASURES MOVING OBJECTS—An electronic instrument capable of measuring the dimension of an object while it is moving rapidly and vibrating is reported ideal for factory use where high speed and laboratory accuracy are required. Developed by Raymond M. Wilmotte Inc., Washington, unit is said to achieve an accuracy of plus or minus 0.0001-inch. In plants, it can be employed to measure the outside diameter of wire, thread, tubing, rod, edge to edge dimension of extruded parts, etc. It also can be modified to measure thickness of sheet, dimensions of certain machined or punched parts, or to routine production test several dimensions simultaneously.

AUTOMATICITY PLUS—Many phases of fabrication are carried out through specially designed equipment in the new domestic range plant of Hotpoint Inc., Chicago. Some of the units provide a degree of automaticity never before approached in the manufacture of electric ranges. One of the machines, for example, is a 450-ton press designed by Verson Allsteel Press Co. in conjunction with Hotpoint engineers. Cold stock is automatically fed from a coil cradle through a stock straightener into the huge press. The first of eight dies in the press blanks out the stock which then proceeds through consecutive stages of drawing, trimming, forming and beading. At each stroke of the press a completed range drawer emerges ready for cleaning and finishing.

WELDING AIDS METAL SPINNING—An automatic seam welder is employed by Milwaukee Metal Spinning Co., Milwaukee, to help form sheets of sufficient size to produce through spinning operations huge heads for milk storage tanks. Because standard sheet widths are more readily available and more easily shipped and handled, two presheared half circles or rectangles are welded together in the plant prior to the spinning procedure. Welds made are so sound that after they are ground down smoothly, there is no danger of rupture to interfere with the smooth operation of the spinning tool.

MATTER OF DRY AIR—When using exothermic gas generators for clean annealing copper and most copper alloys, a 10 to 1 air-gas mixture works out ideally. Use of a refrigerating unit to cool the water in the water tower provides a drier gas — one that is suitable for malleable annealing cast iron. By removing water vapor still further the gas can be used for low-temperature annealing of steel. (p. 54)

LIGHT "AT WORK"—In the Oldsmobile plant at Lansing, Mich., widths of ring grooves for the Kettering engine are gaged by "go" and "no go" floating feeler members operating against individual microswitches that actuate signal lights—red for undersize, green for oversize and blackout for within tolerance. All individual gaging heads and microswitch light circuits of the inspection setup are integrated into one master light. If all dimensions are within tolerance only the master indicator which is white lights up. (p. 56)

"BACK-SAVING" PROCESSING — Mechanical "muscles" are substituted for human brawn in the new handling system now being used by Westinghouse in its East Springfield, Mass., foundry. Employees' load here is lightened some 661,000 pounds per day by the mechanized equipment. In molding 1/6-horsepower refrigerator motor housings, for example, the load previously lifted was reduced from a total of 1322 pounds per mold of four housings via manual efforts to zero by the mechanized setup. (p. 60)

NIMBLE OPERATION—Fast and proper charging of scrap iron in an open hearth furnace is very important. It is an operation that requires the services of an operator efficient and nimble in handling the multiple levers of the powerful charging machine, in order to carry on several operations at one time without damage to the front and back walls of the furnace, doors and door frames, and to rapidly place scrap iron in the furnace to lose as little heat as possible. (p. 68)

Surface appearance and chemical and physical properties of heat treated work can be closely regulated by use of controlled atmospheres produced in exothermic or endothermic generating units

GAS GENERATORS for Controlled

By W. H. HOLCROFT
Vice President and Technical Director
and
M. R. LARSON
Metallurgical Engineer
Holcroft & Co.
Detroit

USE of controlled atmospheres to envelope the work in process enables the heat treater to control closely the surface appearance as well as the chemical and physical properties of the work. Such atmospheres are widely used in clean hardening, clean annealing, carbon recovery, gas carburizing, carbo-nitriding and malleable annealing of ferrous materials, and in brazing and clean annealing nonferrous metals.

These atmospheres consist primarily of a prepared carrier gas, to which may be added small amounts of hydrocarbon gas and in some cases ammonia, depending on the heat treating process involved. Most atmosphere gases are derived from the complete or partial reaction of a mixture of air and hydrocarbon gas in a gas generator, since this method offers greatest economy and maximum ease of control.

Basically, then, gas generators are units for controlling the air-hydrocarbon reaction, and include equipment for proportioning the air and gas input, a reaction chamber, and temperature controls. They may be classified under two general types: Endothermic generators, which require external heating to support the reaction, and exothermic generators, in which the reaction is self-supporting.

Composition of the generator output gas is governed by the requirements of the heat treating process. With the desired atmosphere analysis determined, the percentages of air and gas required by the generator can be readily calculated. Using methane as the hydrocarbon, the analysis of the generator gas to be expected for various air-gas ratios is shown in Fig. 4, which also indicates the type of generator required.

Exothermic Gas Generators — Basic exothermic generator utilizes an air-gas mixture which is burned in a combustion chamber, after which the products of combustion are passed through a contact-type water tower, where excess water vapor is removed to prevent condensation in the piping. Such a generator is shown in Fig. 2. The reaction when using a 10:1 air-gas mixture (with methane as the hydrocarbon) is as follows:

$$CH_4 + 2O_2 + 8N_2 \rightarrow CO_2 + 2H_2O + 8N_2$$

This gas can be used for clean annealing copper and most copper alloys, and has a dew point of about plus 80° F after passing through the water tower. By using a refrigerating unit to cool the water in the water tower, a dew point of about plus 40° is obtained; and this drier gas, being low in hydrogen content, is ideal for malleable annealing of cast iron. With the water vapor still further removed to prevent oxidation, the gas can be used for low-temperature annealing of steel; for the nitrogen is inert and the high CO_2 cannot decarburize the steel, since low-temperature annealing is done below the critical temperature of the steel. Activated alumina is commonly used as a drying medium for such purposes, and gives dew points as low as minus 50° F.

Using additional equipment to remove the CO_2, the resultant gas will be over 95 per cent pure nitrogen, the remainder being CO and hydrogen with traces of CO_2 and water vapor. Such an atmosphere is suitable for bright hardening of steel, including high speed tool steels containing elements that can be oxidized by gases that are reducing to iron.

Sulphur, a common impurity in gases, is detrimental to heat treating, causing discoloration and decarburizing of the stock as well as attacking the furnace operating mechanism. Most of the sulphur is removed in the contact-type water tower; and when it is necessary to remove the final traces of sulphur, as in annealing copper and its alloys, the gas can be passed through activated carbon or iron oxide in an auxiliary unit to provide a sulphur-free gas.

Endothermic Gas Generators—One of the earliest endothermic generators utilized an externally-heated retort filled with charcoal through which a metered amount of air was passed. The chemical reaction involved in this generator is:

$$C + \tfrac{1}{2}O_2 + 2N_2 \rightarrow CO + 2N_2$$

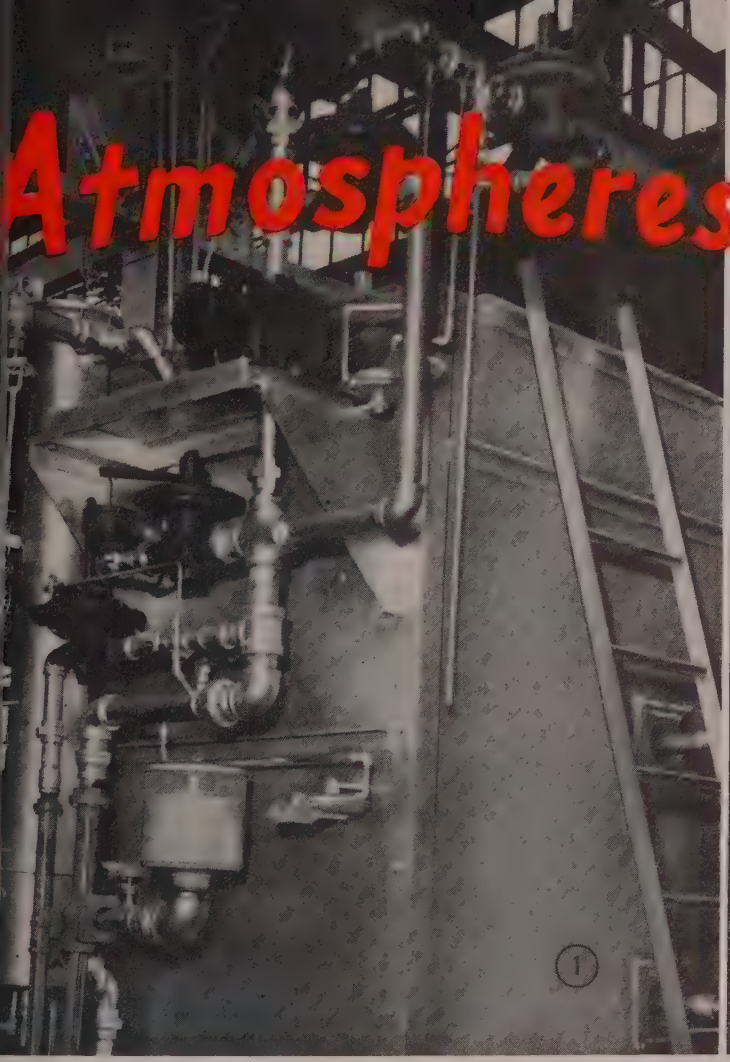
This generator gas analyzes approximately 67 per cent N_2, with remainder CO and CO_2. Since the only source of hydrogen is the water vapor in the input air, hydrogen and water vapor contents are very low. The CO and CO_2 contents of the gas are determined by the reaction temperature, the CO increasing and CO_2 decreasing with temperature increases.

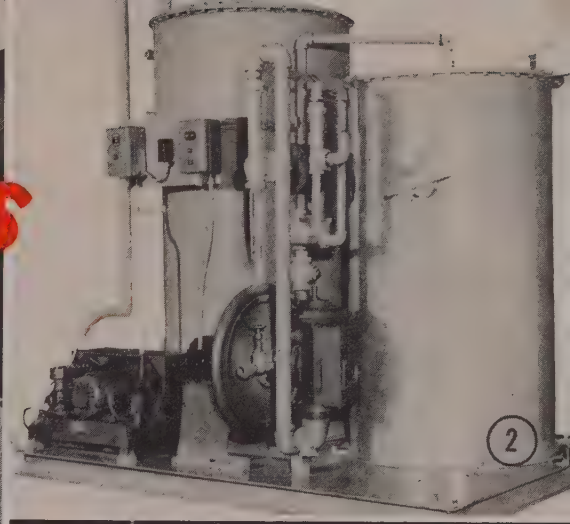
With other generators of the same basic type, air-gas mixtures or products of combustion are passed through the charcoal retort instead of air. The resulting atmosphere gases have higher hydrogen contents, but are otherwise essentially the same, since heated charcoal reduces highly oxidizing components.

Most widely used gas generator is the catalytic type, employing an externally-heated reaction chamber filled with nickel-coated brick as a catalyst. This generator operates with air-gas mixtures in the range shown on the left side of Fig. 4. Gas produced can be maintained at constant analysis over extended periods of time, and both maintenance and operating costs are low.

The catalyst promotes the following reactions:

Atmospheres





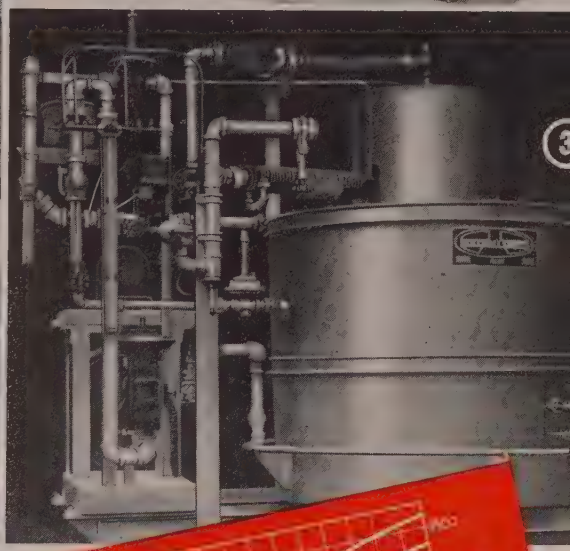


Fig. 1—Close-up of catalytic-type endothermic gas generator, showing input gas proportioning equipment at left

Fig. 2—Typical exothermic gas generator. Combustion chamber is shown at right, and contact-type water tower is at left, with refrigeration unit to cool the water for medium-dew-point gas

Using methane—$CH_4 + \frac{1}{2}O_2 + 2N_2 \rightarrow CO + 2H_2 + 2N_2$

Using propane—$C_3H_8 + 1\frac{1}{2}O_2 + 6N_2 \rightarrow 3CO + 4H_2 + 6N_2$

By changing the air-gas ratio, the analysis of the gas produced can be varied as shown in Fig. 4, and can be readily changed so as to be in equilibrium with steels of different carbon content as required for carbon-recovery processing. This generator, Fig. 1, also produces an ideal carrier gas for gas carburizing and carbo-nitriding. Another generator using the same catalytic principle eliminates the separate heating chamber by including the generator as an integral part of the heat treat furnace.

A recent improvement in the catlytic generator is a high-temperature unit, Fig. 3, which operates at temperatures above 2000° F instead of in the 1800° F range used in earlier designs. The higher temperature insures complete reaction and increases the amount of gas produced per cubic foot of reaction space.

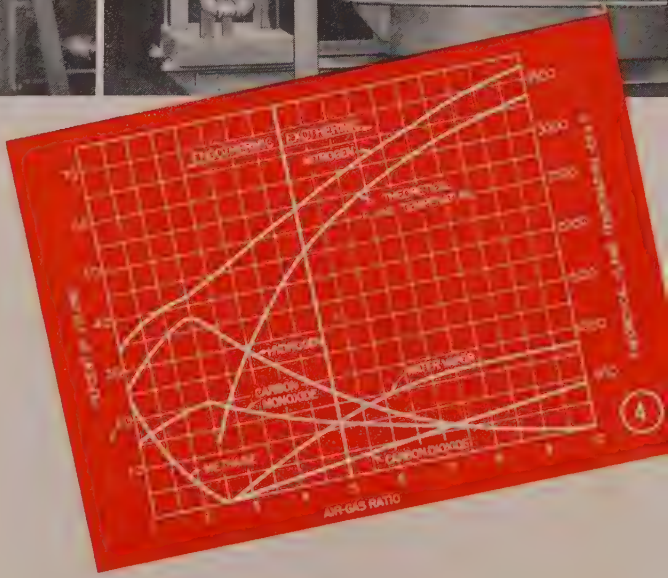


Fig. 3—High-temperature catalytic generator, operating at above 2200° F, assures complete reaction and provides greater output per cubic foot of reaction space

Fig. 4—Generator gas analysis and theoretical flame temperature at various ratios of air-gas input, with methane as the hydrocarbon gas

Cylinder blocks, heads, pistons, piston pins, connecting rods, crankshafts and camshafts are among the parts checked by new types of automatic gaging equipment at Oldsmobile's Kettering engine plant

Air-Electric

Automobile Engin

ACCURATE gaging of cylinder blocks, heads, pistons, piston pins, connecting rods, crankshafts and camshafts, along with the proper matching of sets of components for assembly into an engine, is handled by several new types of air-electric gaging equipment at the Kettering engine plant of the Oldsmobile Division of General Motors, Lansing, Mich. Several of the machines are illustrated herewith, together with some details of their operation.

Probably the most interesting unit is that used for checking each of the bores of the 8-90 cylinder block (a V-8 type) and stamping the proper size designation alongside the bore. The cylinder block comes directly off a conveyor line to the gaging equipment where it moves on rollers into position on a turntable. It is locked in proper locating position by hydraulically actuated shot pins, following which the operator lowers the four gaging spindles into the cylinder bores on one side by depressing an electric control button. Should any of the four spindles fail to enter the bore while being lowered to gaging position, a microswitch stops the downward travel of all spindles and a signal for each spindle indicates interference is being encountered, whereupon the spindles can be retracted to prevent damage either to the spindle or the block.

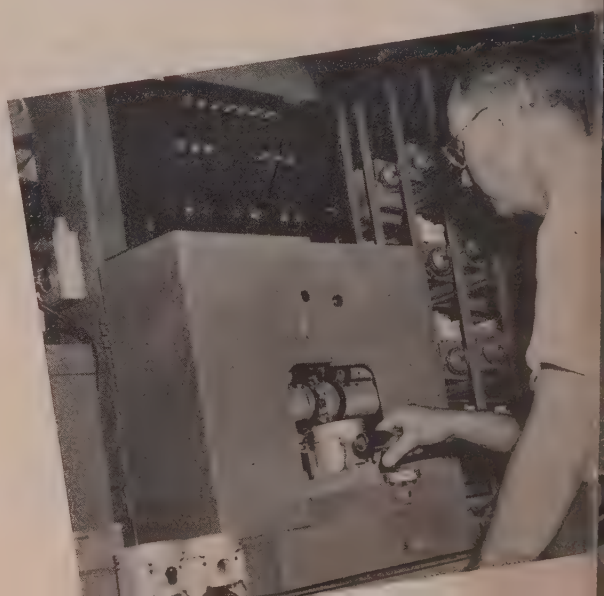
Four Diameter Checks—Each spindle is provided with four sets of air jets to give four separate diameter checks along each bore. Four glass tubes on the face of the cabinet, as shown in Fig. 1, carry small floats, the height of which shows the diameter of the bore at each of the four check points. Charts behind each tube are graduated and lettered in terms equivalent to increments of 0.000125-inch. Lettering, which is used to stamp the block beside the bore, covers the following range: D-DD-C-CC-B-BB-A-AA. If the bores have been properly machined, the four floats will average out to one of the eight letters, after which the operator sets the horizontal stamping tool to the proper letter and allows it to drop on the block, imprinting the letters thereon.

By turning the large crank directly under the glass tubes, the operator rotates the gaging spindles 180 degrees and obtains a full 360-degree check of out-of-round. The "up" button then is actuated to retract the gaging spindles; the turntable is rotated 180 degrees and the spindles lowered into the opposite bank of four bores, where the inspection operation is repeated. Shot pins which lock the block in position are released and the next block to be gaged is moved onto the turntable, pushing the gaged block down the conveyor line to the left. Gaging tools are checked twice daily against masters to insure their continued accuracy.

Simultaneous checking of piston dimensions before final machining of the piston pin holes is done on a multiple-checking unit in which is incorporated an air-snap gage to check the piston skirt. Diameter is indicated by the float position between maximum and minimum markers on a designated air tube. Taper of the skirt is indicated by comparison of float positions in two other air tubes.

Signal Lights Speed Gaging—Widths of three ring grooves are gaged by "go" and "no go" floating feeler members operating separately against individual microswitches, which actuate signal lights—red for undersize, green for oversize and blackout for within tolerance limits. Diameters of the top ring groove land and the first and third ring grooves are handled by caliper-type electric gaging units, which also actuate signal lights. Squareness of the skirt axis with the head within 0.001-inch is gaged by a differential air-electric head, also operating light signals.

All individual gaging heads and microswitch light circuits are integrated into one master light, as shown on the signal panel at the top of Fig. 2; if all dimensions are within tolerance the master light is white, with individual lights extinguished; if any one or more dimensions are out of tolerance, the master light becomes red and the individual signals show which dimensions are off tolerance and whether they are undersize or oversize. Production rate of this



By A. H. ALLEN
Detroit Editor, STEEL

Gaging omponents

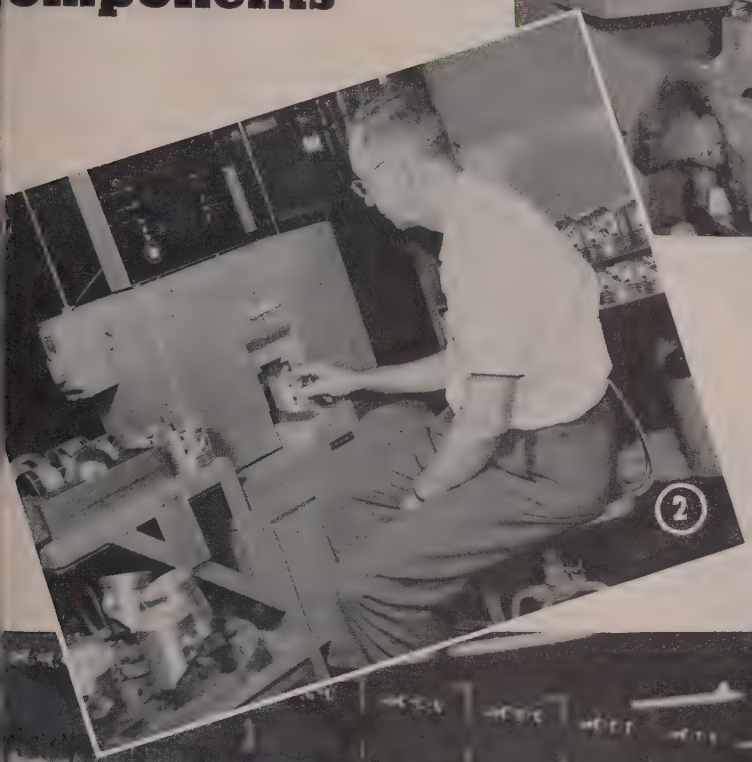


Fig. 1—This unit checks bores of the 8-90 cylinder block and stamps proper size designation beside bore

Fig. 2—Final checking and classifying of aluminum pistons is accomplished automatically on this instrument

Fig. 3—Diameter at base skirt is checked by an air-snap gage in conjunction with air-electric heads which actuate another stamping device to classify the piece

Fig. 4—Crankshafts are checked on this 20-column air-gaging unit

unusual equipment is in the range of 400-600 pistons per hour.

Final checking and classifying of aluminum pistons is accomplished by another automatic device which also stamps on the piston its proper classification based on the pin hole and skirt. Average diameter of the piston pin hole at two points—one spot in each bearing—is checked by a double-column air gage actuating two air-electric heads controlling the mechanism which stamps the piston with the proper number for one of four classifications of 0.0001-inch each. If the hole in one side varies sufficiently from the hole in the opposite side to qualify the piston in two classifications, the larger classification is used.

Diameter at the base of the skirt is checked by an air-snap gage in conjunction with air-electric heads which actuate another stamping device to classify the piece into one of the eight letter-size identifications stamped on the cylinder block. At the same time a light is illuminated over the correct classification of roller conveyor rack into which the piston is placed by the operator. Pistons travel down this rack by gravity and at the opposite end are assembled into matched sets of pistons, rods and pins required by each succeeding block as it nears the assembly point. The piston racks may be seen at the right of Fig. 3.

Air Jets Indicate Diameters — Crankshafts are checked on a 20-column air-gaging unit, shown in Fig. 4. The shaft is positioned in U-shaped receivers, after which the gaging members are brought into place by a counterbalanced hand lever. In the illustration, an operator is checking pin bearings individually and manually. This is an air-snap type of gage which has three sets of jets so as to check the diameter at each end of the pin bearing and also the breakdown of the radius at the cheeks. The three-column gaging indicator is at the left of the bank of instruments.

Five main bearings are checked simultaneously with air-snap gages, each having three sets of jets so as to gage midway between the flanges and ⅛-inch from each flange. These gages are floated so that they may move forward and backward to allow for misalignment due to possible warpage in the shaft. At the same time, the seal diameter and the width of the rear main bearing are checked, both with air-jet type gages.

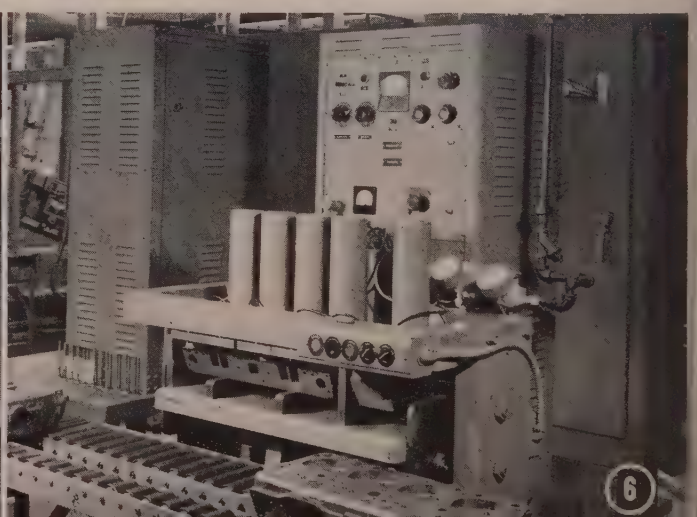
Similar equipment is used to check six bearing diameters and two lengths of camshafts using air-snaps in conjunction with five-column and three-column instrument bases. The shaft is revolved manually to check for out-of-round, and also for concentricity of the five bearings. Runout of the oil pump drive gear is checked by a separate gaging unit mounted in front of the assembly, comprising a mating gear mounted on a ball slide and actuating a dial indicator. Relief hole is checked for clear passage by playing a jet of air into the end, the operator readily feeling the emerging air stream when the passage is unrestricted. A scleroscope is also mounted in front of the gaging station to check hardness while the shaft is in gaging position.

Connecting rods are examined by two air-column units. In one, the large end of the rod is checked for diameter of bore, squareness of the bore with one face, and the thickness and parallelism of the two faces. Parallelism of faces is indicated by comparing the position of floats in two of the four columns of the instrument. A second fixture is used in conjunction with a five-column base for simultaneously checking the parallelism of the large and small bores in both planes and the center distance. Fig. 5 shows a two-column air gage handling the small end of the connecting rod.

Piston pins are checked for average diameter and automatically segregated into six classifications by another type of gaging unit. Pins are loaded manually into a chute which has a "no go" gaging element to prevent oversize parts being accepted by the chute. Accepted pins are gravity fed into a locating "V" where a motor driven arm progresses the part into an air ring. After it (*Please turn to Page* 82)

Fig. 5—Two-column air-gage handling small end of connecting rod

Fig. 6—Intricate unit, known as a cavitometer, tests sonically the volume of combustion chambers in cylinder heads



High-Temperature Ceramic Coatings

...developed for molybdenum

LACK of materials with the required properties for operating temperatures in excess of 1800°F has been a restrictive influence in the development of ram-jets, pulse-jets, turbo-jets and rockets. Availability of materials suitable for use at higher temperatures than those in current use would effectively lessen design problems, making possible, for example, increased specific power in turbo engines.

Because the requirements of stress and temperature for such increased performance are beyond the potentialities of the currently used high-temperature alloys, scientific investigations at the National Bureau of Standards, under the sponsorship of the National Advisory Committee for Aeronautics, have been directed toward the development of ceramic coatings for the metals having very high melting points, in order to protect them against oxidation at high operating temperatures. Preliminary results indicate that molybdenum with a specially designed ceramic coating offers a promising combination for very high-temperature service.

Most of the usual heat-resistant alloys begin to melt when heated within the temperature range 2400 to 2600°F. Of the metals whose melting points greatly exceed this temperature range, only such scarce metals as platinum and iridium, melting at 3180°F and 4260°F respectively, have sufficient resistance to oxidation at high temperatures to be used without protection. Aside from the question of physical properties, the cost of these metals and the limited supply make their use on a large scale prohibitive.

Other metals with high melting points, but lacking adequate resistance to oxidation, include titanium (3270°F), thorium (3350°F), zirconium (3450°F), boron (4150°F), molybdenum (4750°F), tantalum (5160° F), and tungsten (*Please turn to Page* 82)

Above—Specimens photographed after high-temperature flame tests demonstrate protection afforded molybdenum by the presence of a ceramic coating. Specimens B, C and D, protected with a high zirconium-oxide coating approximately 0.033-inch thick, have been treated 30 minutes at surface temperatures of 2600, 3000 and 3400° F respectively. Specimen A, uncoated and 0.040-inch thick, developed a hole in 3 minutes under the same flame adjustment as that applied to D, while all coated specimens showed no decrease in metal thickness after the respective treatments

Extreme left—Ceramic-coated molybdenum is used as Pitot tubes for recording pressures in the 3000° blast of a ram-jet engine. The 10-inch tube on the right is uncoated while that on the left is ceramic-coated except for 1 inch at the end not heated in service

$1,250,000 modernization program at Westinghouse's gray iron foundry shifts materials handling burden to mechanized equipment

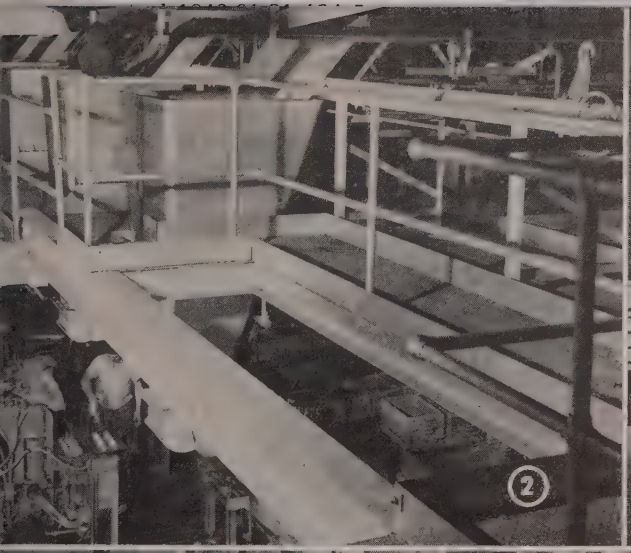
MODERNIZATION of Westinghouse's East Springfield, Mass., foundry has lightened employees' load by some 661,000 pounds per day and transferred it to mechanized equipment, at the same time increasing the daily melt capacity from 60,000 to 100,000 pounds. Manned by 75 men, the foundry produces gray iron castings weighing from ½-pound to 40 pounds; thickness ranges from ⅛-inch to more than 2 inches. Castings are used as components of electrical appliances such as refrigerator compressors, fans, automatic washing machines, etc.

Foundry building is 180 feet wide by 256 feet long, with 46,890 square feet of usable floor space. Three 50-foot high bays and five 24-foot low bays have a total of 1,472,000 cubic feet of space. The foundry is laid out in parallel bays 140 feet long, with melting cupolas located at one end of the center bay. Bay nearest the machine shop is used for cleaning castings; high activity production of motor housing castings goes on in the center bay; third bay is equipped for turning out small high activity castings.

Heating and Ventilating—Forced air unit heaters at strategic areas draw in fresh air from the outside or recirculate air in building. There are 16 unit heaters with a total output capacity of 7,800,000 Btu based on 5 pounds steam at 60° entering air. Ten forced air curtain heaters are located over outside doorways and at entrances and exits of trolley conveyor. These heaters (unit and curtain type) are capable of maintaining a temperature of 60° F inside the building with outside temperature at 0° and a 15 mile per hour wind.

Ventilating equipment includes: Eighteen fan-driven roof ventilators totaling 113,000 cubic feet per minute; three bag type, dry dust collectors, which draw air from dust-producing machines, such as tumblers, Wheelabrators, grinders and sand blasters These dry collectors extract approximately 1 cubic yard or 2430 pounds of dust daily.

Three wet dust collectors totaling 60,000 cubic feet per minute, draw air from dust-producing areas on the sand system, such as shakeouts, mixers, vibrating screens, etc. Major part of the dust collected in these wet dust collectors is carried away with the



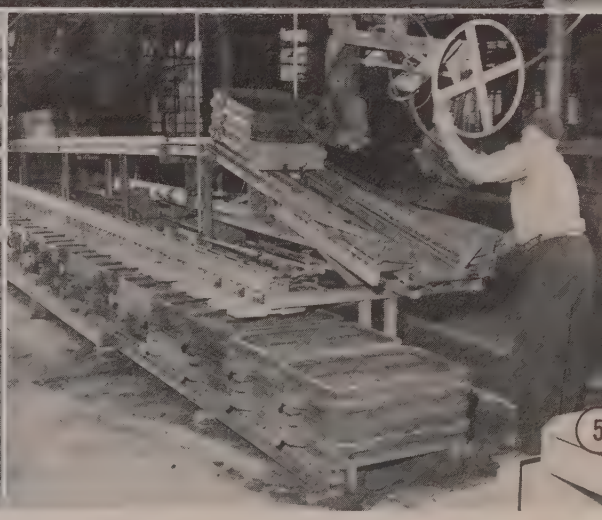


Fig. 1—To conserve floor space the roller conveyor that is used for pouring line conveyor and the return conveyor for drags and copes is a three-decker. The two lower tiers are for out-going flasks, top tier for returning empty flasks

Fig. 2—From sand conditioner, sand is carried by system of rubber belt conveyors to hoppers above the various molding stations

Fig. 3—Completed drag mold is pushed through jolt-squeeze-rollover machine on roller conveyor that runs beside molding machine

Fig. 4—Molder removes drag from molding machine and places it on out-going roller conveyor. He then sets cores. Drag is turned over on a spring hinge as it is removed from molding machine. Cope is removed from molding machine and placed on drag

Fig. 5—Empty flask is pushed up ramp by air cylinder to gravity roller conveyor on which it is returned to molding position

waste water into the sewer. Heavy dust not carried away with the waste water is collected in a settling tank in sludge form. Sludge thus collected amounts to ¼-cubic yard or 1350-pounds daily. Total air withdrawal is 206,000 cubic feet per minute. This results in 8.4 complete changes of air in the foundry every hour.

Special Equipment—A Link-Belt overhead conveyor sand system is used. After passing through the perforated shake out, the sand runs over a magnet pulley that extracts tramp iron. An elevator carries the sand to a vibrating screen where cores and lumps are removed. From here it is moved to a 250-ton hot sand storage bin via a rubber belt conveyor. Two No. 3 Simpson mixers, each driven by a 40 horsepower motor, are directly below the storage bin. It is here that the used sand in the bin is mixed with new sand, clay, and water in measured amounts. The mixed sand is discharged through bottom openings in the mixers to a rubber belt conveyor. The belt conveyor carries the sand to an elevator that discharges it onto a Royer sand conditioner.

From the conditioner, the sand is carried by a system of rubber belt conveyors to the hoppers above the various molding stations. Nine conveyor belts, (including two elevators) totaling 468-feet in length, from 14 to 20 inches in width, are designed to carry hot sand.

An under-the-floor system of rubber conveyor belts returns the excess sand from the molding machines. Each molding machine is set on subway grating over

the spill sand conveyor. Each of the shakeouts discharges the contents of the flask—hot sand and castings—onto an oscillating under-the-floor conveyor that carries both to the perforated vibrating shake out. The under-the-floor system consists of three belt conveyors totaling 220-feet in length, and six Hydra-flow conveyors totaling 196-feet. System of tunnels under the foundry adds up to a total of 430-feet. These tunnels average about 10-feet deep by 8-feet wide. Twenty-seven motors ranging in size from ½ to 50 horsepower, totaling 345 horsepower, are required to drive the complete sand handling—shake out and sand preparation system.

A trolley conveyor 600-feet long, driven by a 7½-horsepower motor carries hot castings from perforated vibrating shake out around the outside of the building to an area adjacent to the cupola charging operations. The conveyor travels about 10 feet per minute, and rises to a height of 22 feet above the ground. The 2 x 4-foot trays on which the castings are carried are loaded automatically and are spaced as closely together as practicable. This conveyor serves a three-fold purpose; (1) to give the hot castings an opportunity to cool down; (2) to keep the heat of the castings out of the building while cooling; and (3), to convey the castings to the next manufacturing operation—sorting.

Benefits and Costs—Mechanization has reduced the amount of material handled by the 75 employees per day from 1470-tons for the manual set-up to 294-tons for the mechanized arrangement. In the case of molding 1/6-horsepower refrigerator motor housings, the load that had to be lifted was reduced from a total of 1322-pounds per mold of four housings for the manual operation to zero for the mechanized arrangement. This includes: 65-pounds for handling flasks; 292-pounds for shoveling sand; 357-pounds for conveying molds; 88-pounds for shifting pouring weights; and 520-pounds for shaking out, conditioning sand etc. The mechanized arrangement completely eliminated these five back-breaking steps and when this is done 500-times per day, the benefit to the employee is staggering, being 661,000 pounds. The entire cost of this modernization program, which was $1,250,000, was sold on the basis of improved working conditions.

Power Supply—All motors for the sand handling and preparation system are operated on 440-volt—3 phase—60 cycle—alternating current power. This power is supplied from a bank of three transformers, connected delta—delta, totaling 1000 kva. Primary voltage is 13,800 and secondary voltage 440. From an 800-ampere circuit breaker connected to the low voltage buss, two 3-phase circuits of 500,000 circular mil cable are run to a sequence control panel from which all motors are operated. 110-volt single phase power is supplied from transformers connected to the 440-volt circuit. This is used for motor controls.

Direct-current power for the magnetic pulley that is used to extort tramp iron from the molding sand

Fig. 6—Cope and drag are filled with sand from overhead hopper with air-operated gate

Fig. 7—Operation of shakeout is unique. Mold rolls into a basket supported on trunnions slightly off center. Weight of the mold turns basket over with sufficient velocity that hot sand and castings are discharged onto oscillating conveyor below when basket hits stop

Fig. 8—Molds are poured from 500-pound geared ladle suspended from a monorail and moved manually along the pouring line

is supplied from a selenium rectifier connected to the 440-volt circuit.

Housing Molding Unit—Molder picks up empty drag with air hoist from gravity roller conveyor that returns drags and copes from shake out. Drag is placed over pattern on Osborn jolt-squeeze-rollover machines which operate pneumatically on 80 pound air pressure.

Drag is filled with sand from overhead hopper with air-operated gate. Machine jolts drag, squeezes sand down, turns drag over, vibrates drag and draws pattern. Excess sand drops through subway grating to spill conveyor belt below.

Completed drag mold is pushed through machine on rollover conveyor that runs alongside molding machine.

Next, the molder picks up empty cope with air hoist from gravity conveyor that returns drags and copes from shakeout. Cope is placed over pattern on Osborn pneumatic molding machine. Cope is filled with sand from overhead hopper with air-operated gate. Machine jogs cope, scrapes off excess sand, squeezes sand down, vibrates pattern and strips pattern all in one automatically sequenced cycle. Excess sand drops through subway grating to spill conveyor below.

Molder picks up cope mold with an air hoist and places it on top of drag mold.

Flask is then pushed down the roller conveyor to an air-operated transfer car that moves mold to position in line with out-going roller conveyor that constitutes pouring lines.

Mold is moved into position on the pouring line by a hydraulically-actuated piston rod built into the transfer car. Air-operated clamping plates hold cope down on drag during pouring operation. These plates are controlled from one point. Molds are poured from a 1000-pound insulated geared ladle transported from cupola to pouring line on a Cleveland tramrail. Four 2-ton Electro-Life hoists are used.

After molds are poured, the shake out operator picks up mold with an electrified jib crane equipped with a specially designed lifting and rollover bail or yoke. Jib crane is one ton capacity—hoist has ½-horsepower motor. Mold is then placed over ventilated vibrating shake out driven by 5-horsepower motor and hot sand and casting are discharged to oscillating conveyor below.

Empty flask is placed on the ramp that leads to the gravity roller conveyor and bail or yoke released. Flask is pushed up ramp by air cylinder to gravity roller conveyor on which it is returned to the molding position.

Hot sand and castings are transported by the oscillating conveyor to the perforated vibrating 4 x 8-foot shakeout powered by a 7½-horsepower motor. The sand falls through the perforations onto the return conveyor belt below while the castings slide into a loading chute for the trolley conveyor. Trolley conveyor transports the castings to the area adjacent to the cupola charging operations where the gates, sprues, and risers are removed. The gates, sprues, and risers are weighed into the pre-determined cupola batch and transported to the cupola charging position by a 2-ton capacity Cleveland automatic monorail dispatch system.

Castings remain in the trolley conveyor trays and are later automatically discharged onto a conically-shaped sorting table. Castings are sorted and sent to the cleaning room by chutes or hoists.

Small Automatic Molding Unit—Molder picks up empty aluminum cope from waist-high position on gravity roller conveyor and places it over pattern on an Osborn molding machine. Empty aluminum drag

is positioned next to the cope as this molding machine is large enough to accommodate both cope and drag pattern. Cope and drag are filled with sand from overhead hopper with air-operated gate.

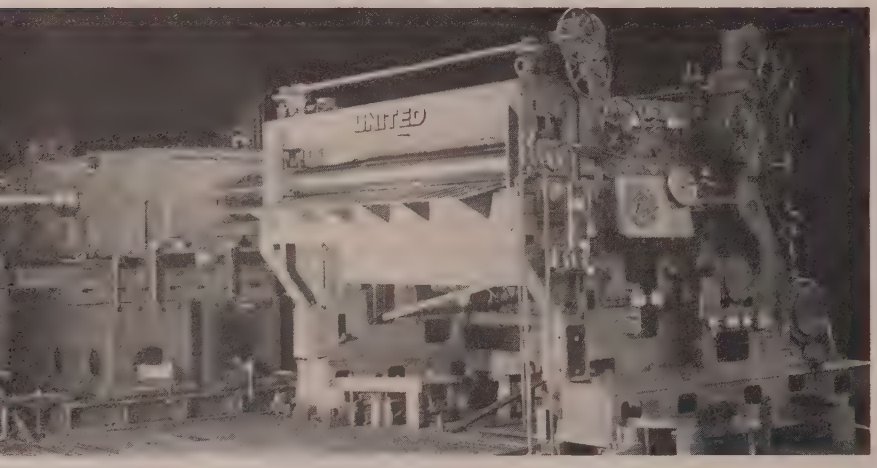
Machine jogs cope and drag, scrapes off excess sand, squeezes sand down, vibrates and strips pattern all in one automatic cycle. Then the molder removes drag from molding machine and places it on out-going roller conveyor. He then sets the cores. Drag is turned over on a spring hinge as it is removed from molding machine. Cope is removed from molding machine and placed on drag.

Flask is pushed down roller conveyor that constitutes the pouring line by means of an air-actuated piston rod.

To conserve floor space the roller conveyor that is used for pouring line conveyor and the return conveyor for drags and copes is a three-decker. The two lower tiers are for out-going flasks; the top tier for returning empty flasks. Air-operated clamping plates hold cope down on drag during pouring operations. These plates are controlled from one point. Molds are poured from 500-pound geared ladle suspended from a monorail and moved manually along the pouring line.

After pouring, molds are moved into shake out as new molds are placed on the roller conveyor and pushed to pouring position. Operation of shake out is unique. The mold rolls into a basket supported on trunnions slightly off center. Weight of the mold turns the basket over with sufficient velocity that hot sand and castings are discharged onto oscillating conveyor below when basket hits stop. An air actuated piston rod automatically raises the basket vertically to return conveyor, righting the basket as it does this and unloading empty aluminum flask onto the gravity return roller conveyor. No bottom boards are used. The flasks have grids in the drag to keep sand in the flask, thereby eliminating the need of using a bottom board.

From this point on, hot sand and casting are handled the same as they are for the housing castings, i.e., the sand eventually finds its way back to the sand system; castings to the cleaning department.



Entry end of flying shear showing leveller and speed synchronizing adjustments

Aluminum Alloy Shearing

. . . performed at line speed of 300 feet per minute

INTRODUCTION of the Talbot type flying sheet shear was made recently to a group of engineers, operators and maintenance personnel representing leading producers of steel, aluminum, brass and copper sheet and strip at the Youngstown plant of United Engineering and Foundry Co. Included in a day long demonstration were actual cutting to accurate lengths as well as free running at a wide range of speeds and miscuts.

Principal difference of the new shear from previous guillotine shears is in the conception of its knife path motion but it has in addition several desirable operational and maintenance features. Bottom knife pitmans are mounted on eccentrics integral with a planet pinion sleeve bushed on main crank eccentric and driven by planet ring gear in timed relationship to top knife main shear frame which is in turn eccentrically mounted on main crank shaft. Variation in number of miscuts is by means of miscut change gears driven from main crank shaft.

Shear shown in the accompanying illustration is designed to cut aluminum alloy from 0.025 to 0.125-inch thick by 106 inches maximum width into length varying from 30 inches to 36 feet at maximum line speed of 300 feet per minute. Three smaller shears of the same type are now in process of manufacture and will be duplicated in most respects except that they will have upcut action, have improved leveller and pitch arrangement and will have capacity to cut 48 to 60 inch wide low carbon and stainless steel strip in varying gages up to 0.090 inch thick maximum.

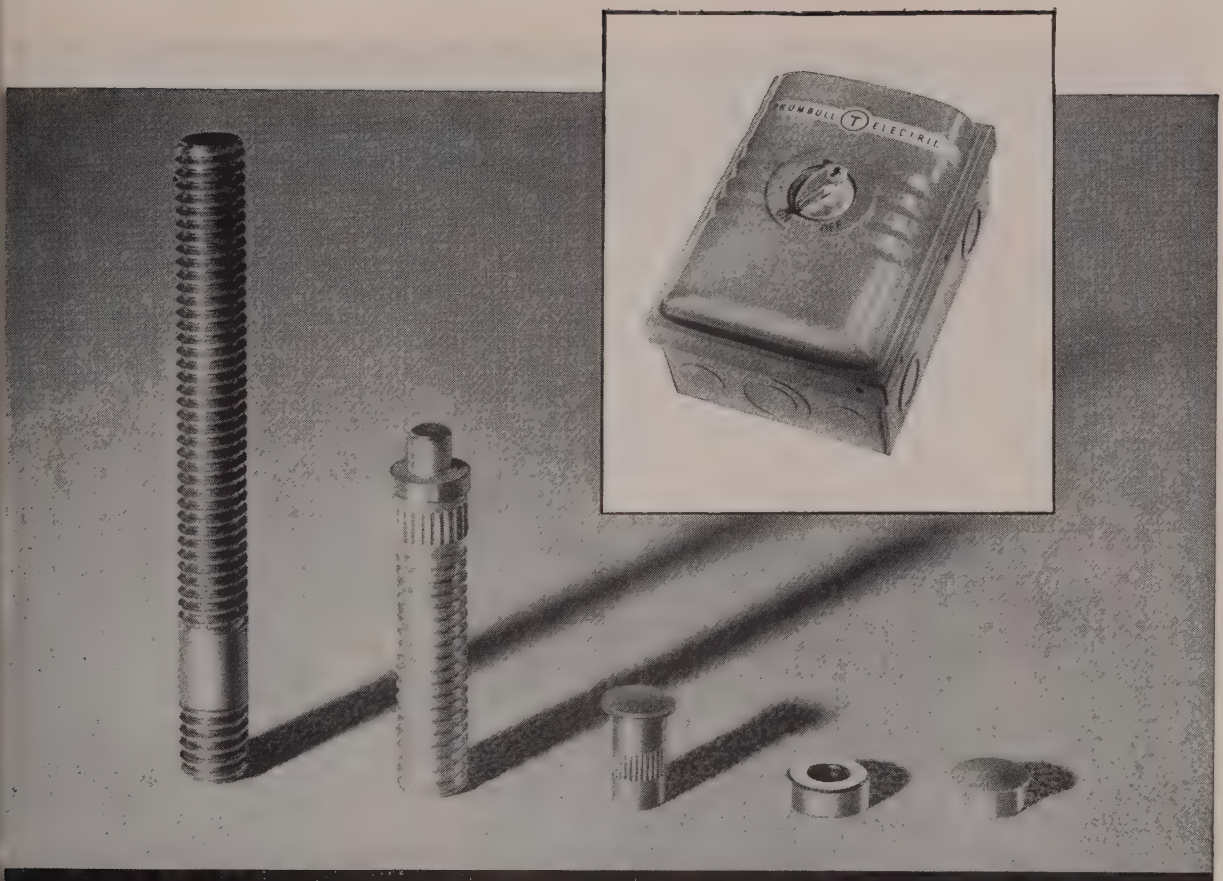
—o—

According to Commodity Standards Division of the National Bureau of Standards, Washington, D. C., printed copies of Simplified Practice Recommendation R233-48, rotary files and burs, are now available from the Government Printing Office. It establishes a simplified list of stock shapes, types and sizes for hand-cut rotary files and milled and ground-from-solid burs.

—o—

OMISSION

A line crediting the American Society for Metals for the article, "Use of Hardness Data Limited," STEEL, p. 63, Jan. 17 issue, was inadvertently omitted. The story was a slightly revised version of the author's paper presented before the annual ASM convention in Philadelphia, Oct., 1948.



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THIS REVERE METAL WILL SAVE YOU MONEY

REVERE makes Free-Cutting Copper Rod, and if you are making electronic devices requiring machined copper parts of high conductivity, it will pay you to investigate the savings made possible by this metal. We would suggest that you make trial runs to prove what it will do under your own shop conditions. That was the procedure followed by The Trumbull Electric Mfg. Co., Plainville, Conn., with these results:

Part #18107 and 18108, contacts for the Type D switch illustrated, were designed around this alloy. Trumbull states: "On both these parts we found we could make them in one operation instead of two. That is, due to the smooth free cutting of the metal, it was unnecessary to perform a facing operation . . . Our Screw machine foreman advises that, in his opinion, both these parts could be made four times as fast as out of ordinary electrolytic copper rod."

#3731, 60 amp. post stud.—5,760 pieces run in 19.6 hours with no machine down-time; 10,425 pieces of ordinary copper rod run in 66.6 hours with 11.8 hours machine down-time. In addition to the extra time required, three sets of dies were used for the regular rod. "The savings of the free-cutting material over ordinary copper were figured at $1.81 per thousand, including in these costs both material and direct labor."

#16552, space washer. "Savings per thousand over electrolytic copper were 77¢. This figure included the material difference and direct labor. In addition, there was an 18% saving in machine down-time."

#K-60-1A, 70-200 amp. stud. "The use of Free-Cutting Copper Rod on this part very definitely increased production and practically voided machine down-time.

In a letter to Revere, Trumbull added: "In general, at least for most of the parts we have used, we find that there is at least a 25% saving in machine time of free-cutting over regular copper. In addition, the workers are enthusiastic about this material, particularly when running studs, because of the fact that it is no longer necessary for them to keep a constant close watch on the machine to see that the turnings do not become tangled up with the moving parts of the machine."

The Trumbull experience is being duplicated in other machine shops. If you have not tried this Revere Metal, we suggest you get in touch with your nearest Revere Sales Office.

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SANDBLASTING OF RAILROAD CARS

INSTALLATION for sand blasting custom-built railroad passenger cars in preparation for rustproofing and painting, was completed recently at the St. Charles, Mo., plant of American Car & Foundry Co. Designed and built by W. W. Sly Mfg. Co., Cleveland, the unit consists of a steel building with dust exhaust and collecting equipment mounted on top. The sandblast building accommodates six operators who can blast the interior or exterior of a car's underframe or the complete skeleton of a car simultaneously. Inside dimensions of the building are 20 x 107 feet.

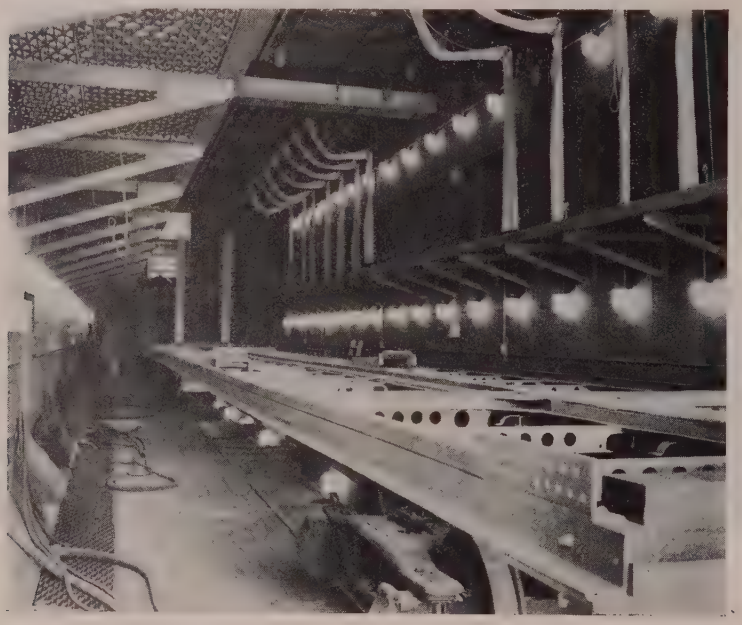
Under the floor a series of hoppers is located to catch the sand used for blasting. Floor of the room at the track level consists of a bar grating. Sand is handled by belt conveyors under the hoppers to a center cross conveyor, to an elevator, onto a distributing conveyor which passes the sand through abrasive cleaners into storage hoppers over the sandblast tanks. There are six such tanks for the six operators.

Elevator, distributing belts, abrasive cleaners, storage tanks and sandblast tanks are located in a leanto on one side of the main sandblast building. Large hoppers under the floor of this leanto provide for sand storage from which the sand is fed automatically into the blast room system as needed.

Controls for the sandblast tank operations are located at the nozzle end of each blast hose line.

Ventilation of such a large blast room is important for the purpose of preventing dust from escaping and to provide for excellent working conditions. In this case ventilation is accomplished by drawing atmospheric air into the room through a slotted ceiling downward into vent ducts near the floor of the room. These vent ducts are formed by the double side walls of the building. Dust-laden air which enters the bottom of the vent ducts is then taken through suitable pipes on the outside of the building to the dust filter equipment on the roof.

In cold weather the air taken in from the atmosphere through the large hoods over the doors is heated by steam coils and a portion of this heated air, after passing through the dust filters, is recirculated into the blast room. All outside walls, doors and roof of the building as well as the dust filters have 3-inch insulation against heat loss. In summertime of course all the ventilating air taken into the room is exhausted to the outside for constant circulation.



Inside view of building, showing a sandblasted frame of a passenger car

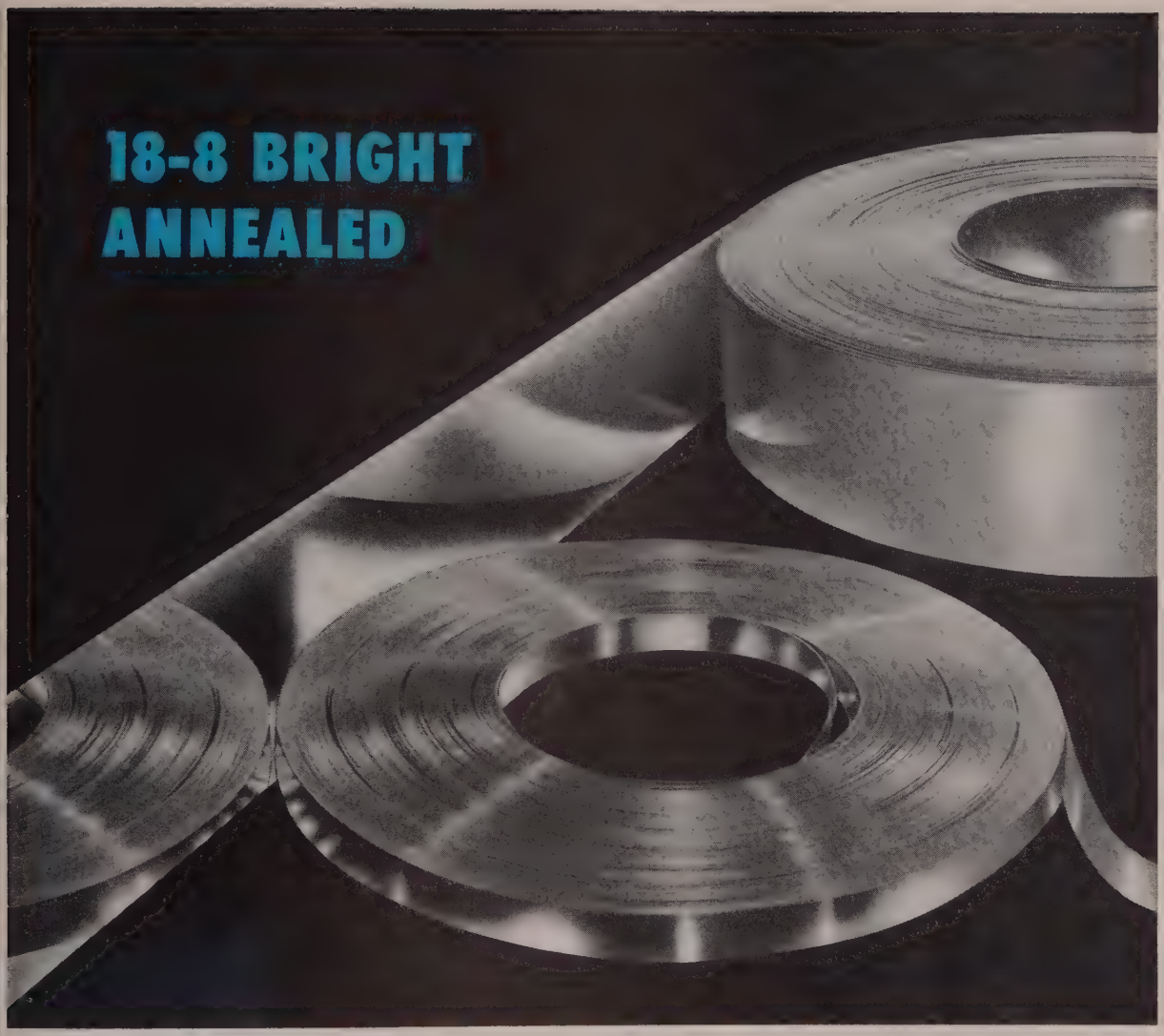
Pressure Blast Furnaces Show Greater Production

Operating results for four blast furnaces converted to high top pressure reportedly confirm the expectations of higher productivity and greater economy. This is based on experimental operations carried on by Republic Steel Corp., Cleveland, in co-operation with Arthur D. Little Inc., Cambridge, Mass., begun in 1944. Republic now has four furnaces operating on high top pressure at Cleveland, Youngstown, Warren (Ohio) and South Chicago and three more conversions are under way.

Mechanical difficulties encountered in the early experiments have been reduced so that lost time on a pressure furnace is now no more than on a normal blast furnace, the engineers state. Erosion of the bell and hopper was one of the early problems, but the hard surfaced, one-piece hopper and the hard surfaced bell on the Cleveland furnace have been used continuously for 26 months and are still in good condition.

Although it had been on top pressure for only 3 months, the Chicago furnace broke its tonnage record in August by producing 3000 tons more than in any previous month since the furnace has been in operation. The Cleveland furnace, operating on essentially a straight ore burden, averaged 1250 tons a day for 6 months at a wet coke rate of 240 pounds per ton of iron, said to be less than any other furnace in the Cleveland district. During the same period the furnace produced an average of only 117 pounds of flue dust per ton of iron while being blown at a wind rate of 90,000 cubic feet per minute.

The Warren, O., pressure furnace has been producing over 1340 tons per day while operating at 6 pounds per square inch top pressure and 92,000 cubic feet per minute with two old turbo-blowers run in parallel. Installation of a new 125,000 cubic foot per minute, 40-pounds per square inch turbo-blower has been completed. The new blower will permit operation at top pressures exceeding 12 pounds per square inch with consequent increase in tonnage, lower coke rates



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PRODUCTION OF OPEN HEARTH STEEL

FUNDAMENTALS of STEELMAKING

NUMBER **3** OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Experiments are now successfully under way to determine temperature of a molten bath of steel by inserting properly protected pyrometric couples into the metal. Metallurgists believe greater accuracy of temperature measurement and better quality steel will result when this process is perfected

By L. F. REINARTZ
Manager, Middletown-Hamilton Division
Armco Steel Corp.
Middletown, O.

PART II

THERE is a saying in open hearth circles that "You can't melt and refine steel unless you can get the scrap and iron into the furnace."

A great part of the efficiency of an open hearth shop depends on layout and equipment available for the prompt and correct charging of the furnaces. To avoid delays in days gone by, charging and pit tracks in an open hearth operation were narrow gage to insure that standard gage switching would not interfere with these essential operations. Today in modern shops all standard gage tracks are installed.

The steam "dinky" locomotive has given way to powerful diesel electric locomotives which are available approximately 23½ hours out of every 24. Track layouts have been refined to make the least number of switches necessary to load and transport raw materials to the furnace floor. (See Fig. 11)

A number of steel companies have found it economical and conducive to better quality control to operate salvage and scrap preparation yards under runways removed from direct open hearth operations. Here miscellaneous prepared and unprepared scrap iron is sorted as to grades; harmful metalloids and nonmetallics are removed; scrap iron is cut to size in order to increase charging pan scrap weights; and light sheet clipping scrap is bundled or baled in a press to increase its usefulness.

Several steel companies have found a "gold mine" in open hearth slag dumps which had been accumulating over many years. Salvage gangs, by the use of bulldozers, heavy trucks, bucket and magnet cranes, have recovered thousands of tons of "skulls" and open hearth pit scrap from such dumps at a cost of $10 to $15 per net ton, at a time when scrap iron is more scarce than it has been for many years. (See Fig. 12)

Fifteen-ton magnet cranes usually serve the open hearth stockyard. A sufficient supply of rugged charging cars, holding from 3 to 5 pans, depending on melt shop size, must be available. Roller bearings in such cars have proved their worth in decreased car maintenance and increased availability for operating time.

Most charging pans in open hearth shops have ca-

Fig. 11—Stockyard tracks showing diesel locomotive transporting charging buggies loaded with scrap iron to open hearth floor

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Fig. 12—Salvage operation at slag dump showing bucket crane in operation, bulldozer at left

pacities of from 20 to 30 cubic feet each. A capacity of 35 to 40 cubic feet would be preferable if existing charging equipment and charging doors would permit the use of this size. Such large pans have been adopted in most recently constructed plants.

Since the scrap iron charge in an open hearth furnace equals 40 to 60 per cent of the total charged, stockers must be trained to place the maximum weight of scrap iron into the charging pans. Previous scrap preparation pays dividends in this operation. Fewer pan loads going into a furnace, the less loss of furnace heat, while doors are open, and less time is required to charge the furnace—both of which are important in production of maximum tonnage with lowest fuel consumption.

More and more emphasis is being placed on handling with cranes such materials as sinter, iron ore, raw dolomite, raw limestone, fluorspar, and other stock supplies. Often these supplies and raw materials are stored in large hoppers or bins in the stock yards by means of locomotive cranes, or dumped into hoppers from a high line and loaded by gravity into charging pans when ordered for furnace use. Burnt lime should be stored on the open hearth floor in bins so as to be in a dry place and readily available for furnace use.

Burnt refractories, used in large quantities in furnace bottom maintenance, should also be available in bins on the charging floor.

Fast and proper charging of scrap iron in an open hearth furnace is very important to the success of the department. This practice is carried on by means of powerful floor type charging machines. (See Fig. 13) Operators of such equipment must be real experts to be able, efficiently, to handle multiple levers, and thus to carry on several operations at one time without damage to the front and back walls of the furnace, doors and door frames, and to rapidly place scrap iron in the furnace so as to lose as little heat as possible, in order that the first helper may take advantage of that particular furnace's tendency to melt scrap iron most efficiently. Happy is management when it has a crew of well-trained, interested charging machine men.

There must be close co-operation and proper understanding between open hearth and blast furnace organizations if open hearth operators are to derive the most benefit from use of "hot" metal in the charge.

Blast furnace molten iron is hauled to the open

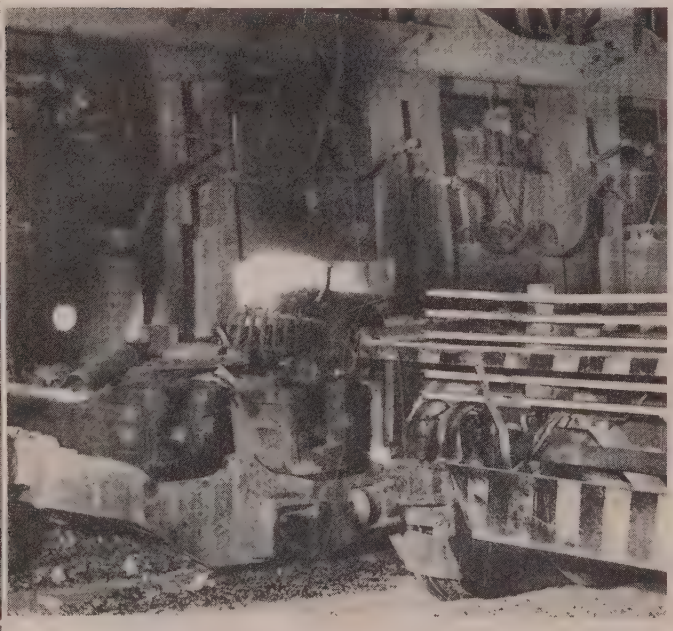
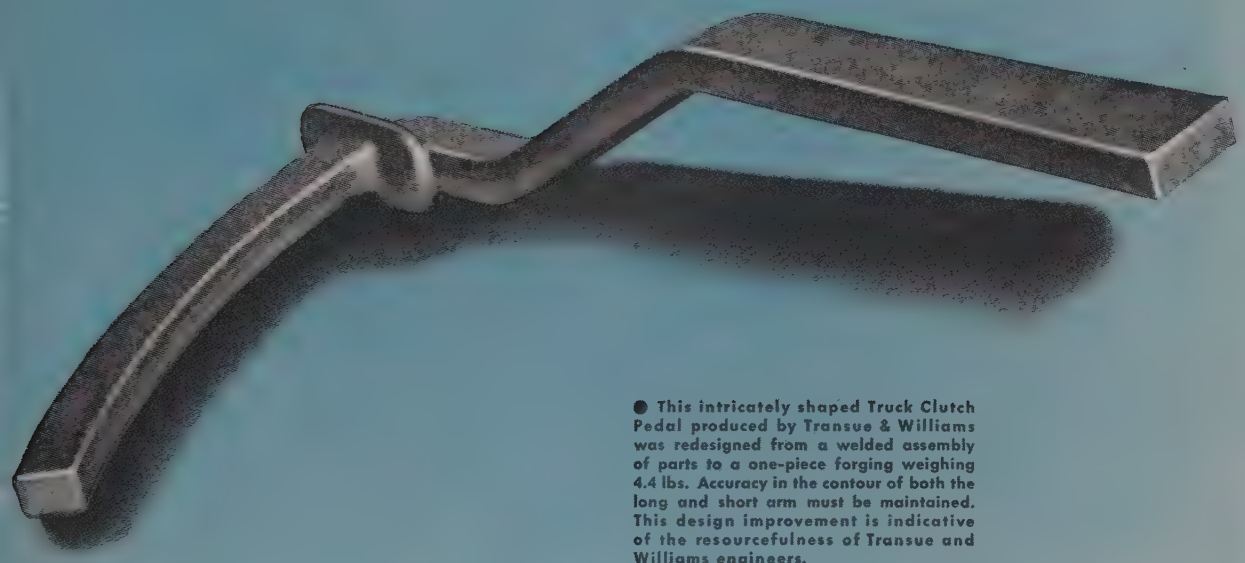


Fig. 13—Modern floor type charging machine moving scrap through an open hearth furnace door. Note that doors and frames are water cooled

TRANSUE FORGINGS



● This intricately shaped Truck Clutch Pedal produced by Transue & Williams was redesigned from a welded assembly of parts to a one-piece forging weighing 4.4 lbs. Accuracy in the contour of both the long and short arm must be maintained. This design improvement is indicative of the resourcefulness of Transue and Williams engineers.

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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

Fig. 14—Hot metal brick lined steel (submarine) mixer cars of 175-ton capacity seen on high track approaching open hearth department

hearth department by locomotives (distances vary from 1000 yards to 12 miles) in open top brick-lined steel ladle cars—with capacities of 50 to 75 tons—or in the more modern submarine type, brick-lined, semi-closed steel ladle cars with holding capacities of 100 to 150 tons of metal. (See Fig. 14) In the open hearth department, this hot metal may be transferred to brick-lined steel "mixers" set on trunnions which revolve in either direction, having capacities from 300 to 1000 tons depending on the department size. When needed by a furnace, molten metal is poured by tilting the mixer in the opposite direction to that used when filling it, and metal is poured into a transfer ladle for movement to the open hearth furnace. Mixers are generally used in very large shops where "hot" metal comes from a number of blast furnaces, and where there is need to average and mix the various casts in order to provide greater uniformity of hot metal for the open hearth furnaces.

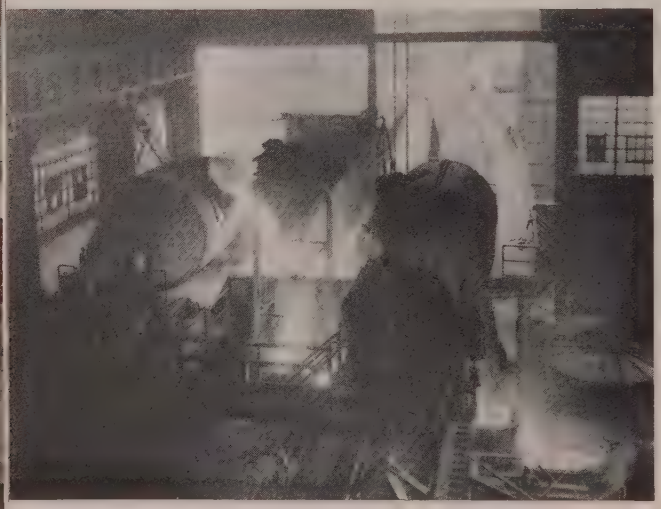

Fig. 15—Desiliconizing operation being performed. Shown above are two high line tracks, mixer ladles pouring hot metal into trough, runners and ladle on lower level on weighing scale. Hopper for iron oxide scale is seen above trough

There is considerable doubt as to the mixing benefit derived by storing hot metal in such equipment. Under certain circumstances, stratification of various casts of dissimilar analyses in the mixer is marked. Some mixers are equipped with oil or gas burners to maintain temperature of the "hot" metal while holding for open hearth furnace use.

In plants where "hot" metal demand is not so great, and where raw materials—such as iron ore, coke, and limestone in the blast furnace operations are fairly uniform, and technique of operation in that department is good—the uniformity of hot metal, from cast to cast, may be sufficient to pour this metal directly from submarine ladles into open hearth transfer ladles and then into the open hearth furnace. In order to make it possible to use a greater percentage of hot metal, in furnaces having relatively small hearth area, in a few plants molten iron is conditioned when it reaches the open hearth department by being treated with roll scale (iron oxide) which has been salvaged from rolling mill operations, to reduce its silicon content 0.20 to 0.50 per cent. (See Fig. 15) Dry scale is added in predetermined amounts from a suspended hopper to a mixing trough as a regulated amount of hot metal is dumped into the trough from a high line on one or both sides, depending on whether two analyses from separate ladle cars are to be averaged. A violent reaction takes place as metal runs from the trough down a runner around a series of right angle bends—for mixing purposes—a distance of 40 to 60 feet into the transfer ladle. This ladle rests on a scale at a lower level so accurate weights of hot metal may be charged into the open hearth furnaces. A series of curves are made available to show the operator proper amounts of scale to add for given weights of hot metal at various temperatures.

For example, 6250 pounds of scale are required to treat 100 tons of hot metal at a temperature of about 2650° F for reduction of its silicon content from 1.00 to 0.60 per cent. There is a temperature rise in

Fig. 16—Dumping hot metal into open hearth furnace. Note brick-lined spout extending into furnace. Spout is placed in front of furnace by charging machine and removed the same way after the pour

the metal in the transfer ladle of 30 to 40° F because of chemical reactions in this operation.

The reaction slag should not be dumped into the open hearth furnace. It is, therefore, common practice to carry on this conditioning operation ahead of time and allow the transfer ladle to stand for 20 to 30 minutes to solidify slag on the hot metal so that it will not be poured into the furnace with the hot metal. Hot metal, which is carried in transfer ladles on large hooks suspended from a large floor crane, is poured slowly into the open hearth furnace by being dumped from this ladle, as it tilts about its trunnions. (See Fig. 16) In order to perform this operation, a cable which is fastened to the crane auxiliary hoist on one end, and to the eye bolt near the ladle bottom on the other end, is slowly hoisted. Metal flows into a brick-lined steel spout which has been placed before one of the furnace charging doors and which extends several feet into the furnace. Great care must be exercised in this operation so as not to pour too rapidly or break down the door bank—otherwise, metal, resulting from a "break-out" will be lost on the floor. This occurrence means lost furnace time and damage to both track and floor. Floor maintenance in front of open hearth furnace charging doors is a difficult problem. One plant has improved this condition by laying a special type of casting on the floor. (See Fig. 17) Charges of hot metal may be made in one or two operations, depending on the transfer ladle size. In a number of shops, open-top hot metal ladles are brought directly from the mixer or blast furnace to the furnace on a buggy riding on a track located behind the charging machine track on the melting floor. It is very important that hot metal be charged into a furnace at the proper time—too early or too late additions may cause bad flush-off slag conditions, or may prolong heat time by delayed melting of the charge.

Crushed ferromanganese, ferrosilicon, aluminum and other supplies are usually stored in bins on the open hearth floor in order to reduce work of the furnace crews and have these materials readily available.

Operation Requires Great Skill

In operation of an open hearth furnace, great skill, physical stamina, and long-time experience are essential for the best results.

When a heat of steel has been tapped, furnace bottom and banks which have been eroded or damaged by action of the metal, silica and iron oxide in the slag of the preceding heat, are repaired by additions of burnt refractories and raw or burnt dolomite. In most cases in modern shops, this hard hot work is done, without too much physical effort, by means of a dolomite machine, which, under the control of a furnace man throws, by centrifugal force, repair material onto back walls or banks of the furnace hearth. (See Fig. 18) Front banks are repaired by directing a stream of material from the machine against the bowl of a large steel spoon. The material bounces from the spoon to the front bank. This machine has has been a labor-saver and has greatly improved furnace maintenance technique. About 8000 pounds of dolomite are used in each operation—which is completed in 30 to 60 minutes.

Fig. 17—Brick lined castings which are placed between charging tracks on open hearth floor

Fig. 18—Machine operator placing dolomite on furnace bank by centrifugal force. Notice spoon for front bank repair

When a furnace is charged, limestone, which acts as flux for impurities is charged on the hearth bottom. Limestone chunks should not be too large or the melting period of furnace operation will be delayed. Also, they should not be too fine or it will have a tendency to stick on the furnace hearth bottom.

When the limestone does float, such material will make a "mucky" slag causing the furnace roof to run "hot" before it can be "cut up," or dissolved by reactions with iron ore or fluorspar additions. Limestone should be very low in magnesia—under 1½ per cent —or it will be difficult also to detach the stone from the furnace bottom, and too much of such stone in the charge will produce a viscous slag which causes difficulty in handling during the refining period. In some plants some scrap iron or pig iron is added first to the hearth bottom in order to prevent limestone from sticking to the bottom. In "cold" metal shops burnt lime may be substituted for raw limestone in the charge, which makes it possible to charge less slag-making material and pig iron, thus speeding up melting operations.

Various Forms of Scrap Used

Scrap iron is charged after the limestone addition. It may consist of plant scrap such as open hearth pit scrap, ingot butts, rolling mill crops and cobbles, sheet or structural scrap and miscellaneous mill scrap —plus purchased scrap iron—such as scrap bundles, steel turnings, farm, automobile, railroad or mixed dealer's scrap iron. After the furnace has been operated for several hours, molten iron is added. If more than 50 per cent of the charge consists of hot metal, it will be necessary to charge sinter or iron ore on the hearth bottom, when a furnace is first charged, to help remove excess carbon and silicon from such additional iron.

Sinter is a mixture of fine iron ore and iron scale, which has been mixed with coke breeze, and semifused or sintered into larger sizes in a sintering machine

It is possible in high hot metal charges to remove quite a large percentage of impurities in the original charge because, when ore or sinter floats, it reacts with the molten metal, and huge volumes of CO-CO_2 gases are created. Molten slag and metal rise like foam in the furnace and the slag, being lighter, overflows through a 12-inch oval hole about 12 inches above the top of the sill plate in the rear furnace wall into a slag ladle in the pit. (See Fig. 19) This is known as a "flush-off." A lot depends on the success of this operation whether a fast or a slow heat of steel results—and whether detrimental elements, such as phosphorus, are removed. After the furnace is charged, it is up to the first helper in charge of the furnace to operate it at as high a temperature as brick work in the laboratory of the furnace will stand in order to melt the charge as quickly as possible. As the charge continues to melt, limestone begins to float up on top of the molten semipurified metal, having less specific gravity than steel. It melts and forms a slag which acts as a protecting cover for the molten metal as well as providing a medium to remove impurities, such as phosphorus, sulphur, and silica from the metal bath. Fluorspar, in small doses, may be shoveled into the furnace to help melt chunks of limestone floating in the slag, and to condition the slag so as to render it more fluid. Care should be exercised not to add an excessive amount of this spar. Sinter or iron ore is added to reduce carbon in the metal. These materials also help to increase the fluidity of

Fig. 19—Flush-off slag running from rear of open hearth furnace into slag ladle or pot

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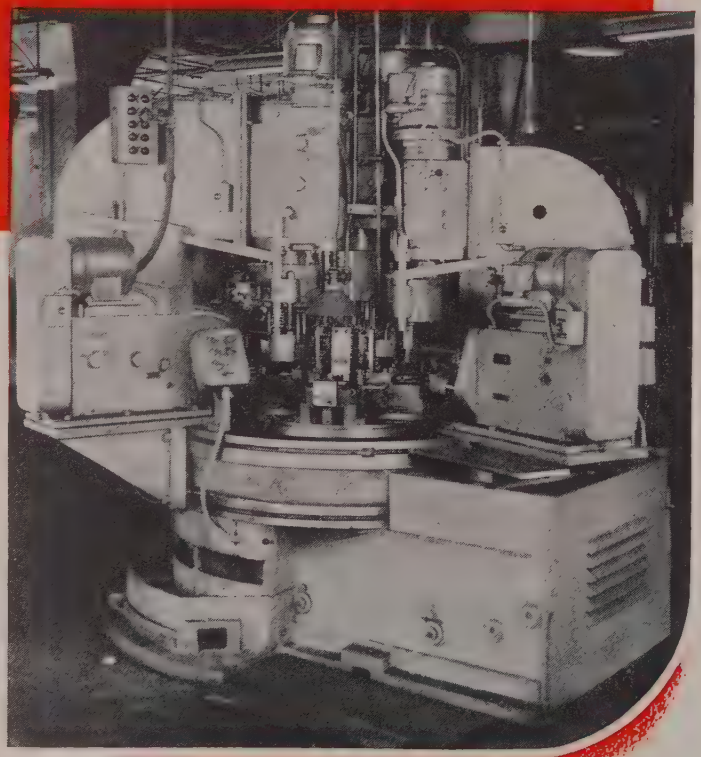

The automatic drill press shown here is equipped with the following standard Century motors:

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1 — one horsepower 1735 RPM vertical motor on a vertical feed

2 — one horsepower 1155 RPM horizontal motors on cross feeds

1 — one and one-half HP 1155 RPM horizontal motor on cross feed

1 — one horsepower 3500 RPM vertical motor on vertical feed

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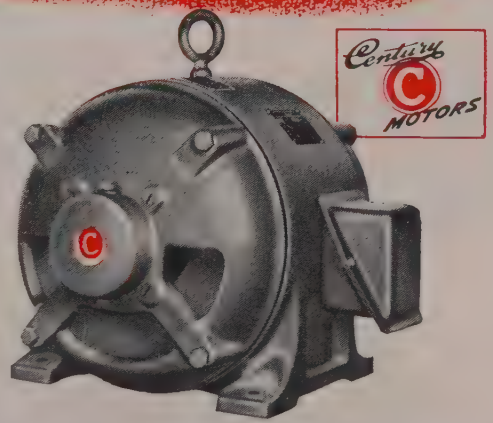

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Fig. 20—Briquetted fine iron ore at exit end of drying furnace. Fine ore is used to expedite furnace reactions

Fig. 21—Reducing carbon in a low carbon rimmed steel heat by "poling" with green saplings

the slag. (See Fig. 20)

In ordinary practice, when making low carbon steel heats, the metal bath should not have more than about 0.50 per cent carbon, when melted, otherwise, an excessive amount of iron ore may be required to reduce carbon to the required specification point. Addition of such excess ore usually creates a thin, watery slag, which must be thickened with burnt lime additions. This operation always lengthens heat time.

It is, also, detrimental to a fast ingot production rate to melt the charge so close to final carbon specification that little or no ore can be added. In such a case, the metal and slag bath is "dead" with little action in the slag. This practice is detrimental to furnace roof life, because such a slag reflects heat to the furnace roof. Metal in such a heat may actually, on the other hand, be too "cold" to tap. It may even be necessary to add one or more charging pans of pig iron or to add oxygen to the bath in order to create an action in the metal which will help bring it up to tapping temperature. Heats must not be "ored" within an hour of tapping time in order to be sure all ore has worked through the bath. Likewise, repig must also be worked through the bath for almost the same length of time before tapping to prevent quality difficulties occurring later on. In making low carbon steels, 3 to 4-inch diameter green saplings may be inserted into metal bath to remove the last few points of carbon. (See Fig. 21)

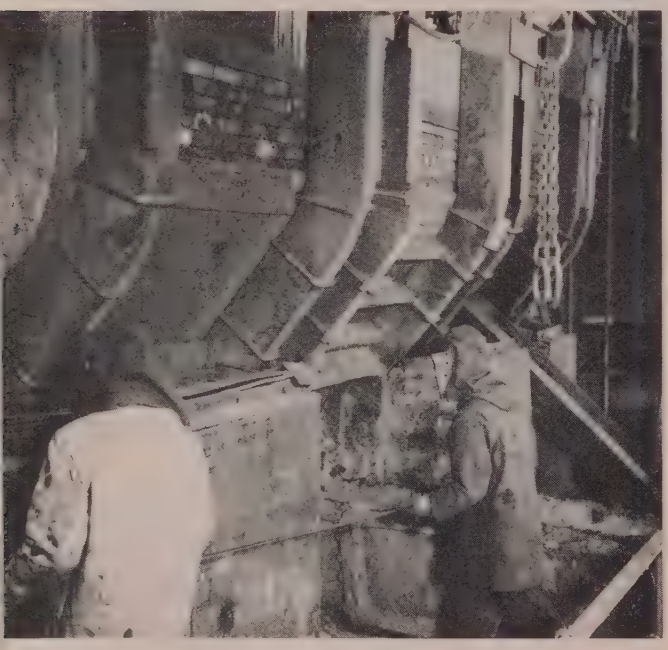

Fig. 22—Furnace men opening open hearth tap hole from back-standing in rear of furnace by means of oxygen lance. Safety clothing and brick-lined metal-cased wall protect men from break-outs

Samples Checked for Carbon

During this operation or working period, small samples of molten metal (say 2 to 4 pounds) are taken out of the furnace with a steel spoon which has first been thoroughly slagged by stirring it through the slag.

The sample then is poured into a test box, cooled and broken on an anvil into two pieces with a sledge hammer in order to examine the fracture. It is possible to roughly determine how carbon is being reduced by noting appearance of the fracture. Experienced melters can read the fracture of such a test piece within 0.01 per cent carbon in low carbon steels. Samples may be sent to the chemical laboratory towards the end of the refining period for determination of manganese, sulphur, copper and carbon by the chemist. A slag sample is also taken in a similar manner and analyzed by chemists for lime-silica ratio.

If lime the ratio is too low—for example, in rimming steel below a 3 to 1 ratio—burnt lime will be

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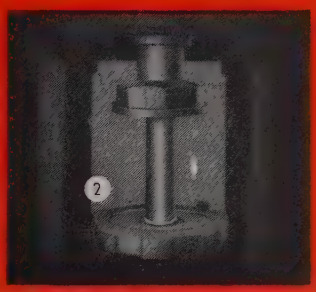

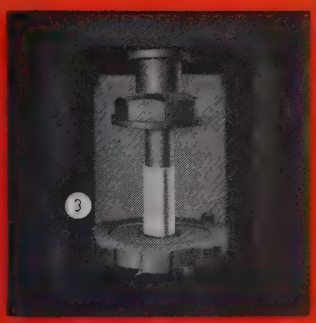

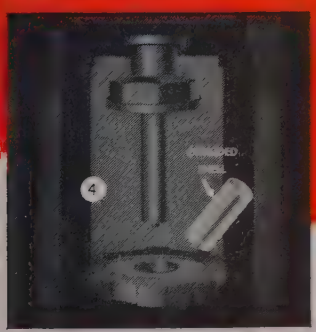

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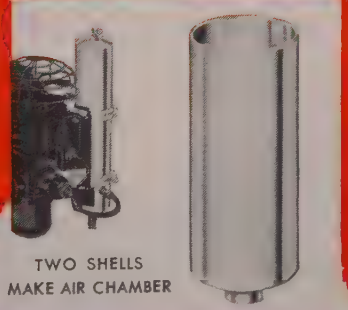

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added to change that ratio and render the slag more basic. Spar and ore will change the ratio in the other direction if slag is too basic—in other words, too "limey."

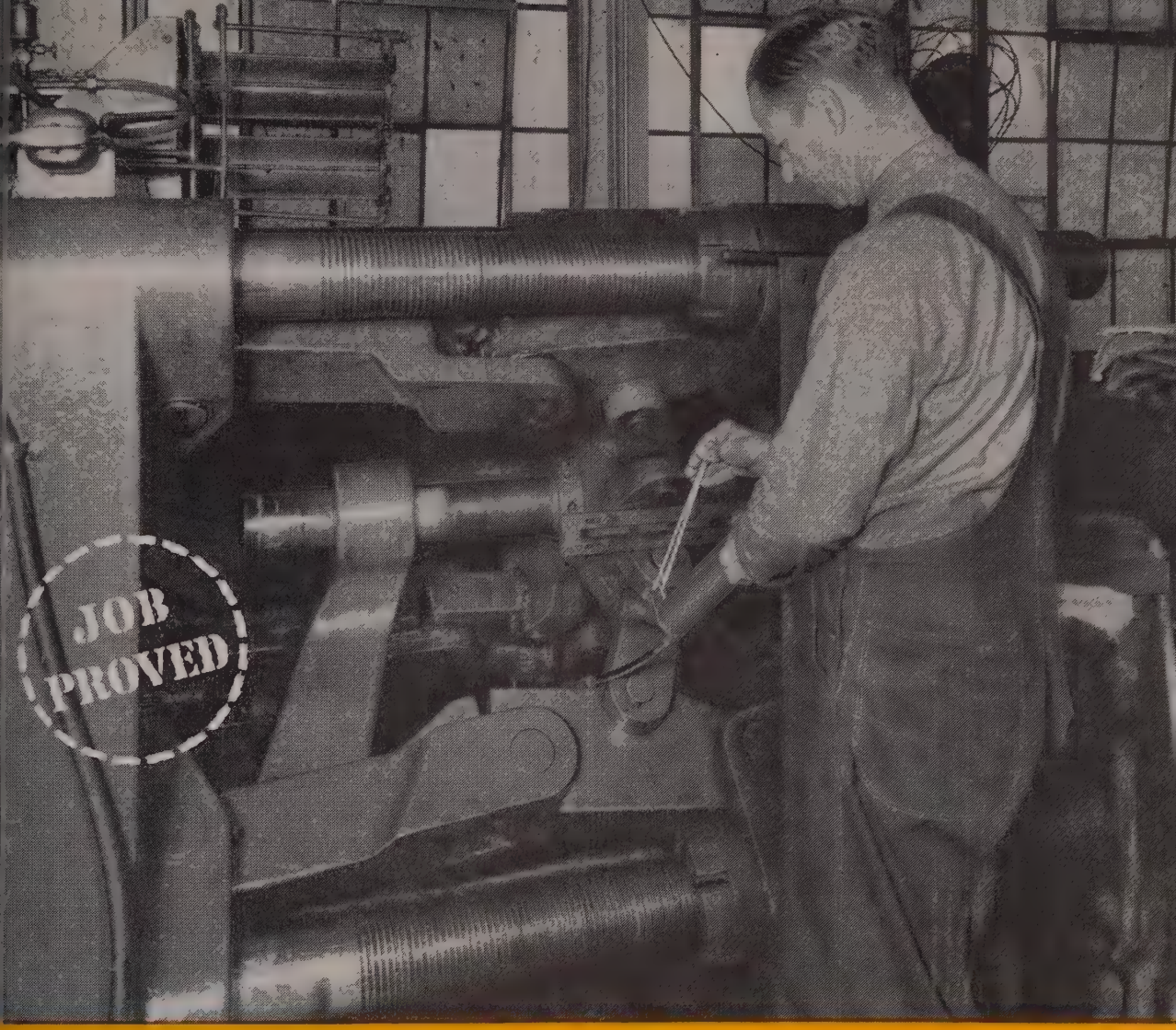
When heat is within specifications, temperature of the metal bath may be estimated in several ways: 1. Melter's opinion of temperature by observing color of the inside furnace walls and slag, through the wicket holes of the furnace charging doors, by means of melters' blue glasses. 2. By pouring slowly on the floor a sample of molten metal, drawn from the furnace with a carefully slagged spoon. If a "skull" or steel residue is left in the spoon, the heat is too "cold" to teem properly. 3. By stirring a low carbon 1½-inch square steel rod, about 10 to 12 feet long, back and forth through the furnace center door in the metal bath, the experienced furnace man can tell by the "feel" of the metal, and appearance of the cut end of the rod, when it is withdrawn from the furnace, how hot the metal is and whether it will teem clean or leave a "skull" in the ladle. 4. Experiments are now successfully under way to determine the temperature of a molten bath of steel by insertion of pyrometric couples, properly protected, into the metal. It is believed by metallurgists that greater accuracy of temperature measurement and better quality of steel will result when this process has been perfected and placed in regular use as an actual operating tool.

When chemical specification is "in the groove," slag is of a creamy consistency, and temperature is high enough, the melter gives a signal to tap the heat by blowing a whistle, ringing a bell, or tapping a gong. It is the end of 10 to 12 hours of hot, hard work and a lot depends on the next half hour's operations whether quality of the heat is to be maintained until metal has started to solidify in the mold.

At this point the second helper is told to open the tap hole, which is done by digging out the dolomite from the hole at the rear of the furnace—a hot dangerous job. (See Fig. 22) Then furnace men on the charging side insert a 1½-inch square iron rod, 20 feet or longer, into the furnace through the wicket hole of the middle charging door, and punch an opening through the crust on the inside of the tap hole and then finally through the hole, itself. The climax comes when, with a great shower of sparks, molten steel begins to pour out of the furnace. This is always an awesome spectacle even to a long-time open hearth operator. (See Fig. 23)

(*To be continued*)

Fig. 23—Tapping a 180-ton heat of steel. Slag is being eliminated by over flowing from the ladle into a slag pot



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Sun Lubricant Reduces Toggle Pin Wear 70% and Minimizes Shutdowns in Die-Casting Plant

In injection-molding zinc die castings, a manufacturer was experiencing excessive wear and breakage in toggle pins. The lubricant in use, which was applied to the pins by gun, just couldn't stand up under heavy-duty operation.

Asked for his advice, a Sun engineer recommended a grease which had been "Job Proved" in many machines of the same type. Over a period of 14 months, use of this Sun grease resulted in 70 percent reduction in breakage of pins. Translated into hard cash, this represented a $300 saving. In addition, costly shutdowns for pin replacement were greatly reduced.

Records like this are not unusual in plants where Sun "Job Proved" greases and oils are used. You can rely on these lubricants to help keep equipment operating steadily and safely, with minimum time-out for maintenance. For the booklet "What Makes a Good Grease," write Dept. S-1.

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Ceramic Coatings—*Concluded from Page 59*

(6100°F). The last three are of especial interest from the standpoint of potential applications in very high temperature service. From a practical viewpoint, however, only molybdenum is available in very substantial quantities, there being comparatively large ore deposits in the United States. The preliminary work on the development of a protective ceramic coating that would permit metals of this type to be used at high temperature in oxygen-bearing atmospheres was therefore done with molybdenum.

Ceramic coatings developed to provide this protection to molybdenum are applied in the form of water suspensions or "slips" to cleaned specimens of molybdenum by either dipping or spraying. After drying, the pieces are fired at a temperature of 2150°F in oxygen-free atmospheres. The furnace is the only special equipment needed beyond that normally used in applying ceramic coatings.

A number of coatings were prepared. Some of these were outstanding in resistance to thermal shock while others had good resistance to high temperatures. One of the better coatings, M-13-33, consisted of (1) a base coat of a low-expansion frit with 20 per cent zirconia added, (2) a cover coat containing 95 per cent zirconia and (3) a seal coat consisting of a thin application of the same composition as the base coat.

Coated specimens were subjected to several significant performance tests during the bureau's investigations. These included heating in a gas-oxygen flame, heating at constant temperature in an air atmosphere, and service testing in the blast of ram-jet engines.

Results of these various tests indicated that the oxidation of the molybdenum was greatly retarded by the best of the ceramic coatings tried. In an air atmosphere at 1650°F, unprotected molybdenum sheet was found to decrease 0.02-inch in thickness in ½-hour. There was no decrease, however, for ceramic-coated molybdenum heated for 70 hours under the same conditions.

At a gas temperature approximating 3500°F, giving a surface temperature on the specimen of 2600°F or more, only short-time protection of the molybdenum was attained. The oxidation rate at these high temperatures was found, however, to be sufficiently retarded by the presence of the ceramic coating to make the use of coated molybdenum feasible for special high-temperature applications in which prolonged service is not required.

An immediate application of these ceramic coatings is the protection of molybdenum Pitot tubes which are built into the nozzle end of ram-jet engines used for pilotless aircraft. These tubes, which are subjected to a gas temperature of about 3000°F, are expendable and need not last over 5 minutes. A simulated service test of a ceramic coated tube indicated a life in excess of 45 minutes.

The need remains for coatings which will have greater durability and which can therefore be used for high temperature applications where longer service life is required. However, in additon to Pitot tubes, other examples of equipment in which even short-time protection can be valuable include coated thermocouples and resistance thermometers made of high-melting point metals.

INDUSTRIES FOR CHEMISTRIES

In the article contributed by Maurice N. Landis, manager of metallurgical and research divisions, LaSalle Steel Co., Chicago, p. 263, Jan. 3, 1949, STEEL, the word "industries" was substituted for "chemistries". This fails to convey the thought intended, and also permits possible unfavorable implications not supported by the author.

Air-Electric Gaging

(*Concluded from Page 58*)

comes to rest, it is checked by jets mounted in the air ring which operate air-electric heads. These in turn actuate solenoids which open and close trap doors to the segregating chutes. The pin then is pushed through the air ring by the next piece and is carried along by the traveling mechanism until it reaches its proper slot. The unit will handle about 2400 pins an hour.

An intricate unit known as a cavitometer for sonic testing the volume of combustion chambers in cylinder heads is shown in Fig. 6. Heads are removed from the conveyor, clamped into position and the machine actuated, revealing through a system of signal lights, oscillators and other eletcrical controls the comparable volumes of the four combustion chambers.

The machine is essentially a comparator, comparing the volume of a master (fixed to the machine) to the volumes of the cavities in the head being checked. The principle of operation is that sound waves of a known frequency are projected into each cavity; the volumes give different responses (resonate) and this is picked up by a receiver and transposed electronically into direct volume readings. The machine cycles automatically, checking each cavity in succession and stops (red or green light indicator for plus or minus) when one is beyond the limits. The unit will handle 150 heads per hour and is accurate within about 0.06 per cent.

Cast Iron Pipe Output Increased by New Unit

A sand spun horizontal casting machine for producing cast iron soil pipe has been developed by Herman Pneumatic Machine Co., Pittsburgh. First machine built for commercial operation, it is scheduled to be installed this spring in the foundry of a southern producer under a license agreement. It is expected this operation will be mechanized to an elaborate extent from the feeding of the sand to the flasks, pouring of the metal, centrifugal casting of the pipe, and conveying of the pipe to the cleaning room.

Anticipated output of soil pipe at this plant is projected between 120 to 136 pieces of 5-foot pipe per hour. The Rol-O-Cast machine, as it is called, is expected to produce 192 pieces of 5-foot lengths per man per 8-hour shift. In addition to soil pipe, the machine can be modified to produce liners, bushings, ring pots, cast tubing and other castings.

The equipment consists of four flasks centrally controlled for simultaneous horizontal spinning. It is designed to produce 2, 3 and 4-inch inside diameter soil pipe of single and double hubs. Because of the centrifugal method, the pipe is positively round in diameter, making it possible to be cut with a pipe cutter. The method also eliminates gates or risers, results in 100 per cent yield and provides the customary advantages over statically poured pipe.

This seven-car accident jammed traffic on New York's West Side Highway when a motorist stopped to read a sign!

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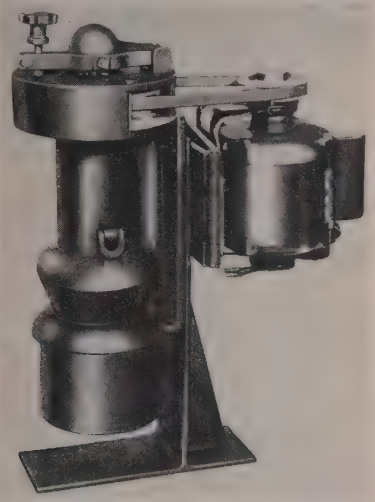
Pulverizer

Developed for pulverizing iron ore, the Davis pulverizer, made by Lerlab, an affiliate of Lerch Brothers Inc., Hibbing, Minn, may also be used for pulverizing rock, coal and other types of ore. One pound of average iron ore, previously crushed to 4 mesh



or finer, can be crushed to 100 mesh in 2-1/4 minutes, or 4 ounces of ore in 30 seconds. Being a vertical machine, it has the advantages of uniform wear and easy cleaning. Elimination of gears provides quieter and smoother operation.

An adjusting device regulates the plate adjustment to produce a sample to pass 80, 100 or 200 mesh screen. Charging chamber, grinding chamber and sample pan are entirely enclosed and charging door closes automatically. Drive is through a rubber V-belt. The pulverizer may be completely disassembled, cleaned, plates changed and made ready for operation in an hour.

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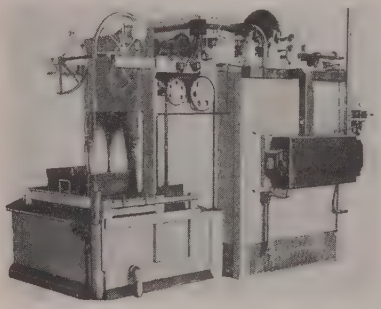
Gas Cyaniding Furnace

Uniform case depth throughout the entire load with a variation of only plus or minus 0.0005-inch on a 0.003-inch deep case is claimed for the new batch type furnace announced by Dow Furnace Co., Maccabees Bldg., Detroit 2, Mich. Design features include a screw drive mechanism for loading and unloading of the furnace and higher speed of heating by means of six U-type radiant tubes surrounded by a "heat capacitor".

A gas generator system of catalytic type is incorporated in the radiant tubes to supply a gas neutral to medium high carbon steels. Safety controls, oil circulation and oil cooling equipment are incorporated into the design. Floor space required is

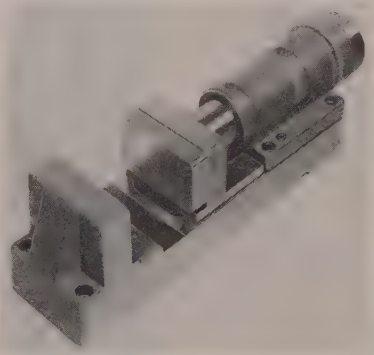


7 feet 6 inches by 12 feet 6 inches and headroom required is 13 feet 6 inches. Additional features are: 1½-horsepower drives for inner door and quench tank elevator, circulating fan, gravity roll tables for stock handling.

Check No. 2 on Reply Card for more Details

Punching Units

Standardized hydraulic punching unit with cylinders interchangeable on different bases comprise a line introduced by Progressive Welder Co., 3050 East Outer Drive., Detroit 34, Mich. Units may be used for almost every production job involving,



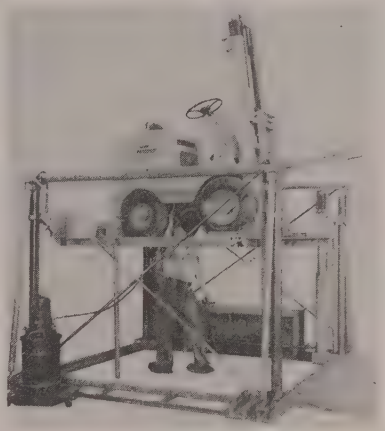
punching, shearing, notching, trimming or forming. They are offered in eight different types of base mountings and are standard in 2, 3, 4, 5 and 6-inch diameters and stroke lengths of 1, 2, 3, 4, 5 and 6 inches.

Interchangeability of cylinders on the various types of bases permits almost complete equipment salvage when retooling. Features include positive hydraulic return of the piston and dash-pot cushioning at both ends of the stroke to prevent slap of the piston. A drain port inside the outer-most sealing ring drains any leakage back to the reservoir.

Check No. 3 on Reply Card for more Details

Truck Maintenance Lift

Service Caster & Truck Corp., Albion, Mich., is manufacturing an electric hydraulic lifter for the servicing of all makes of fork lift trucks, in-



dustrial trailers and platform trucks. Built in 6000 and 12,000 pound capacities, the maintenance lifter's open platform elevates trucks to a proper height where lubrication, inspection and servicing may be accomplished.

Safety features include hooks which lock into the legs at any point during the platform's rise and safety-pipes which drop from the platform to the floor once the proper height is attained. Dead-man control, open platform permitting complete accessibility for lubrication and maintenance work, a method for chocking truck wheels and a support block on which truck counterweights may rest are additional features.

Check No. 4 on Reply Card for more Details

Openside Planer

G. A. Gray Co., 3616 Woodburn Ave., Cincinnati, O., is announcing its adjustable - convertible openside planer on which manual or power adjustment of the outboard housing provides effective utilization of the left hand side head. Jobs of unusual width may be accommodated by the removal of the outboard housing which is mounted on a wide runway secured to the main bed.

Four main bearing surfaces are provided. The housing may be securely locked against these surfaces. A one-shot pressure oiling system as-

deft

deft best describes a BROSIUS Auto Floor Manipulator at work in the forge shop. Deftly and quickly it draws or charges—moves with independent facility across the floor—raises and lowers and rotates the forging blank under hammer or press. Each unit has sturdiness and sensible engineering for which BROSIUS steel mill and blast furnace equipment is well known. BROSIUS manipulators will bring to your forge shop added safety, added speed, added economy —you should be using them. Write to us.

Edgar E. BROSIUS Company Inc.

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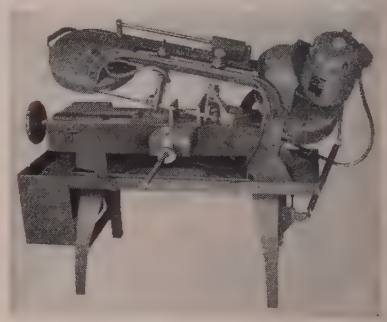
sures complete lubrication of the runway bearings. Both power operated clamps are automatic and synchronized. Left hand side head is actuated by a self-contained rapid traverse system and its feed and automatic

tool lifter mechanisms are connected with the main systems. Table speeds are up to 300 feet per minute. Planers may be equipped with nonmetallic table ways and space saver drive.

Check No. 5 on Reply Card for more Details

Wet Cutting System

Announced by Wells Mfg. Corp., Three Rivers, Mich., is a new self-contained wet cutting system for the Wells No. 5 utility model horizontal



metal cutting band saw. Use of such a flushing system permits safe use of higher feet-per-minute cutting speeds. Blade efficiency is also increased.

Portability of the machine is retained, as the full area chip pan is firmly mounted between bed and legs. The complete system also includes fluid tank with centrifugal type pump-motor unit and a screened intake, as well as tubing and a flow control valve. All working parts are readily removable and easy to clean.

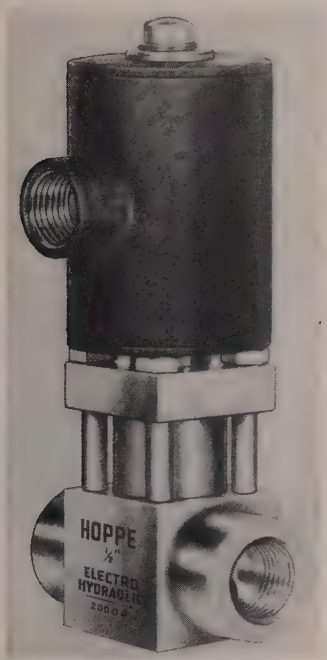
Check No. 6 on Reply Card for more Details

Solenoid Valve

Made of brass bar stock, the type D-2B electro-hydraulic solenoid valve announced by Hoppe Engineering Co., Greensboro, Ind., has all moving and wearing parts made of stainless steel. These parts are cylinder, piston, disk, seats, pilot core and pilot disk.

Valve is designed to give service

with steam of 250 pounds pressure and freon, gas, water, light oils and other noncorrosive liquids and gases up to 2000 pounds. It is made in sizes from 1/4 to 1 inch. All coils are wound for continuous duty for



any voltage or cycle. Also made with an all steel body of various alloys and designated as type D-2S, it will handle acids, alkalies, salts and various chemical compounds.

Check No. 7 on Reply Card for more Details

Grinding Machines

Electronic table traverse which provides an infinite number of traverse rates and improves the accuracy of reversal is incorporated in the improved Filmatic 20, 24 and 28-inch heavy duty traveling table roll grinding machines announced by Cincinnati Milling & Grinding Machines Inc., Cincinnati 9, O. Automatic wheel balancing eliminates the human element and requires only a few seconds. Each of the three swing sizes is built in five between-center lengths of 8, 10, 12, 14 and 16 feet.

Grinding wheel spindles run on Filmatic bearings which require no adjustment or maintenance and which are lubricated with filtered oil. The spindle can be equipped with automatic balancing. Mechancially traversed table has electronic controls which provide an infinite range of traverse rates from 3 to 120 inches per minute. Other electrical controls accelerate and decelerate table at reversal, eliminating shock and "coasting". Camber or crown on rolls

THE RIGHT FURNACE

for the right job!

Perfect timing and uniform heating are two important factors governing low-cost, increased production at The American Fork & Hoe Company's plant in Ashtabula, O.

The Gas Machinery Company of Cleveland designed and installed a special oil-fired Rotary Hammer Welding furnace, carrying thermal head upwards of 2900° F. to heat work to 2300° F. at high speed.

The unit provides fast, localized heating, which is a must in the split-second heating process necessary in this continuous operation.

GASMACO engineers have the right furnace for increased, economical production for you.

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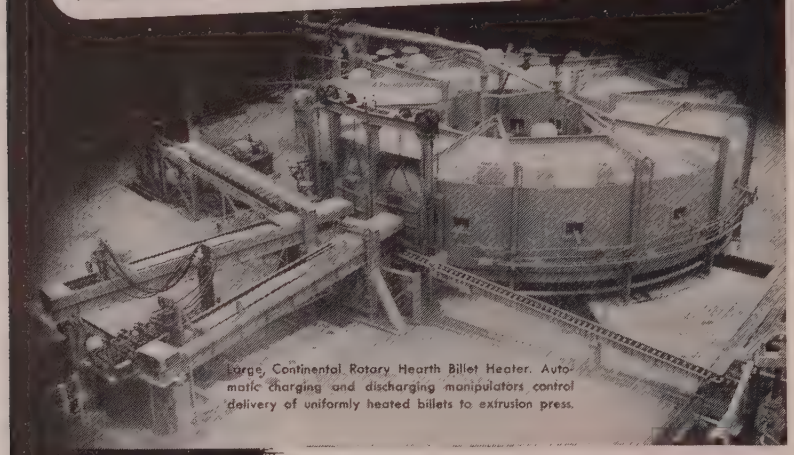
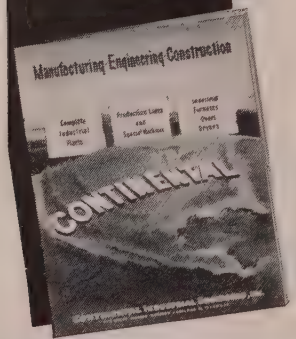


Large, Continental Rotary Hearth Billet Heater. Automatic charging and discharging manipulators control delivery of uniformly heated billets to extrusion press.

PRODUCTION UNITS
BUILT FOR
Nitriding
Cyaniding
Sintering
Carburizing
Annealing
Hardening
Melting
Brazing
Drawing
Billet Heating
Metal Coating
Malleablizing
Ore Smelting
Salt Baths
Soaking Pits
Forging
Core Baking
Mold Baking
Drying
Electric or Fuel Fired



for planned performance

Whatever your problem in any industrial heating process, CONTINENTAL has the solution.

CONTINENTAL planned performance starts with the analysis of your problem and production requirements. It carries through with the selection and development of the best methods, estimates costs and savings, designs and builds the equipment, and provides the work-handling accessories and control devices. Furthermore, CONTINENTAL handles the complete installation, turning over to you a unitized, producing job with guaranteed results.

Our 25 years' experience and diversified research have produced numerous original designs and improved procedures. All of this data is available for preliminary planning. CONTINENTAL invites you to share its engineering "round table" to discuss the expansion, remodeling, or modernizing plans you have in prospect. There is no obligation.

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FURNACES
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SPECIAL MACHINES
COMPLETE PLANTS

MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

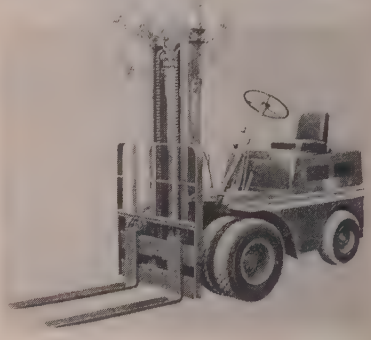
is obtained through a tilting wheelhead cambering unit.

Check No. 8 on Reply Card for more Details

High Lift Axle, Tires

Stability and safety in high lift operation of pneumatic tired fork trucks is provided by a special wide drive axle which mounts dual tires, designed by Clark Equipment Co., Battle Creek, Mich. The wide axle is recommended for Clark Yardlift-40 models where operations require lifts of more than 144 inches.

Tests have shown that the dual tires provide considerably more traction and greater flotation, resulting in smoother, safer operation over soft ground and on many surfaces so rough as to be unsafe for solid tired machines. Axle is available for either factory or field installation. Easily attached fenders are included.



Check No. 9 on Reply Card for more Details

Second Operation Machine

Known as model VBS, the high speed precision second operation machine offered by Hardinge Brothers Inc., Elmira, N. Y., has a No. 21 Brown & Sharpe style stationary collet. This type of collet is valuable when close tolerances exist for length or shoulder specifications.

Preloaded ball bearing center-drive headstock spindle offers 1-inch round, ⅞-inch hexagonal and ¾-inch square collet capacity. Eight spindle speeds are available in either forward or reverse direction from 230 to 3500 revolutions per minute. Three other speed ranges are available to meet varied production requirements. Other features are har-

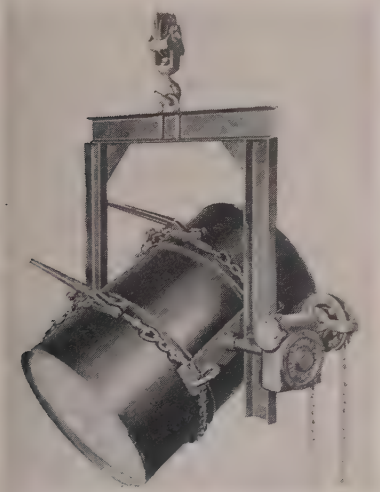
dened and ground dovetail bed ways, constant full bearing double tool cross slide, automatic indexing six-position preloaded ball bearing turret and self-draining oil pan with integral sump.

Check No. 10 on Reply Card for more Details

Drum, Barrel Tilt

Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich., is manufacturing an improved drum and barrel tilt which features an enclosed safety type locking device. Gear units are housed in a steel case, running in a bath of oil to keep out dust, dirt and metal chips. This gives added safety in preventing barrel slippage and lengthens gear life.

Tilt is turned by a worm drive, hand chain operated. It can be



turned a full 360 degrees. The tilt now in production has a 1000 pound capacity and is designed for a standard 55 gallon drum or barrel. Special sizes are available on order. The 125-pound unit is constructed of heavy structural steel and is welded throughout.

Check No. 11 on Reply Card for more Details

Impact Tool

With standard accessories, the model 8U electric impact tool manufactured by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., is rated to run and remove nuts up to 5/8-inch thread size, drive and remove studs, extract broken cap screws and studs, run wire brushes, drill brick, metal and masonry, tap and ream. It may be used on such heavy jobs as removing covers from machines, tightening or loosening nuts on large pipe collars and for general all purpose maintenance.

Motor is reversible for removal of

A section of Unitcast's production molding line where one machine averages a mold every two minutes.

. . of Models and MOLDS

The skill and patience of craftsmen that execute miniatures often compares but never attains the degree of detail . . . comprehensive detail that is required of craftsmen who mold dependable steel castings.

For example, Unitcast's production molding system is based on coordination of details. Here, in the hub of the foundry, materials from sustaining departments meet prearranged schedules to initiate the form of fine steel Unitcastings.

It is difficult to visualize what comprehensive details are actually necessary to operate Unitcast's precision mass production! Briefly, advance planning must be thorough and, as jobs enter actual production, a daily re-check on schedules maintained. Continuous production of numerous types, shapes and sizes of Unitcastings requires that schedules be coordinated with supply lines and molding equipment capacities. Pattern equipment must be transposed properly and the entire battery of molding equipment must be kept operating efficiently.

Yet, it's all in the days work. With Unitcastings, like model making, painstaking time and patience have established long records of proven standards that assure Unitcast's customers the benefit of efficient casting proceedure. Take advantage of Unitcast's *proven* experience . . . for your next job specify Unitcastings!

Unitcast Corporation, Steel Casting Division, Toledo 9, O. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

PRODUCTS LAST LONGER BUILT WITH STRONGER UNITCASTINGS

UNITCAST *Corporation*

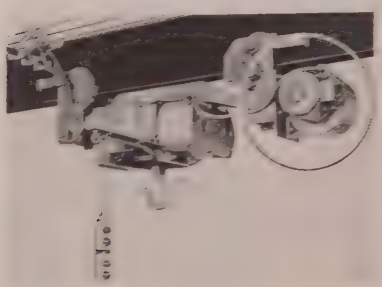
ELECTRIC STEEL CASTINGS

screws, studs and nut. Even if the spindle stalls, the motor will not burn out. The impact principle operates whenever resistance is met, providing extra power to push through the job. Virtually no torque reaction is transmitted back to the operator. Weighing 9 pounds and 13 ounces, the 12-⅛-inch long tool is available for 110 or 220 volt current.

Check No. 12 on Reply Card for more Details

Self-Propelled Hoists

A double-action hydraulic coupling, connecting the motor and a simple gear train, provide a sustained flow of power to impart a smoothness of operation to the new high speed self-propelled hoists developed by Robbins & Myers Inc., Springfield, O. The



coupling eliminates jerks and jolts by absorbing shock loads and dampening out torsional vibrations. Full motor torque is evenly applied at all output speeds.

Advantages derived from the use of fluid drive include flexibility of acceleration and deceleration, closer control of heavy loads in limited space areas and smoother braking. Cushioned starts and stops prevent unnecessary damage and abuse resulting from operator overcontrol and mechanical inefficiency.

Check No. 13 on Reply Card for more Details

Camshaft Gage

Complete and almost simultaneous gaging of the most critical dimensions and conditions of an automobile camshaft is possible with Airsnaps used in conjunction with a five-column and a three-column Precisionaire base instrument, all made by Sheffield Corp., Dayton 1, O. Six bearing diameters and two lengths of the camshaft are checked, the shaft being revolved manually to check for out-of-round and also for concentricity of five bearings.

Runout of the oil pump drive gear is checked by a separate gaging unit consisting of a mating gear mounted on a ball slide and actuating a dial indicator. Relief hole is checked for clear passage by playing a jet of air into the end, the stream of air being felt by the operator when the passage is unrestricted. A scleroscope is mounted in front of the front gaging station to determine hardness while the camshaft is in gaging position.

Check No. 14 on Reply Card for more Details

• • •

AERATING DEVICE: Bin-Dicator Co., Detroit 15, Mich., announces Bin-Flo, an aerating device to provide uniform and steady flow of bulk materials from bins, hoppers and chutes. It is a small plate which is readily located at points where flow is restricted. Low-pressure air is injected into the material through a special fabric diffuser, causing material to flow freely.

Check No. 15 on Reply Card for more Details

WELDING ROD: Designated as Eutechrom, a superhard, low heat welding rod specifically designed as a universal rod to overlay worn or defective parts on machinery and equipment is available from Eutectic Welding Alloys Corp., New York 13, N. Y. It is available in sizes ¼, $\frac{5}{32}$ and $\frac{3}{16}$-inch.

Check No. 16 on Reply Card for more Details

CANOPY CUTTER: No. 657 canopy cutter has been added to the line of Wiremold Co., Hartford 10, Conn. It is a hand punch designed to cut fluorescent fixture canopies to take 500 or 700 Wiremold raceway.

Check No. 17 on Reply Card for more Details

WELD BOSSES: Ohio Nut & Bolt Co., Berea, O., offers weld bosses made for projection welding to sheet metal and to thin metal plates. They are available in thicknesses ranging from 1/16 to ¾-inch and shapes are round, square and flanged.

Check No. 18 on Reply Card for more Details

READING DIAL: A direct reading dial for use on all small and medium size lathes, milling machines and other machine tools is announced by Van Dyke Instruments Inc., Glendale, Calif. It is adaptable to all shaft diameters from ¼ to 11 16-inch.

Check No. 19 on Reply Card for more Details

VALVES: Fairbanks Co., New York 3, N. Y., offers 300 pound bronze globe and angle valves featuring interchangeability of the disk and seat combinations for full portway and throttle portway use. Three types include either heat-treated stainless steel plug disks and seats of approximately 500 brinell hardness or nickel alloy radial disks and seats, while all three are constructed with back-seated rings having a pressure tight joint between seat ring threads and line pressure.

Check No. 20 on Reply Card for more Details

HYDRAULIC GEAR PUMP: Designed particularly for applications where there are rigid space restrictions, the 100 series Hydreco four-bolt oil hydraulic gear pump is offered by Hydraulic Equipment Co., Cleveland, O. Pumps are available in ratings from 2.25 to 4.5 gallons per minute delivering at 1000 pounds per square inch and can be furnished with either flange or foot mountings.

Check No. 21 on Reply Card for more Details

SLIDE SWITCHES: Two new slide switches, announced by Stackpole Carbon Co., St. Marys, Pa., are type SS-26, a single-pole single-throw switch and type SS26-1, a single pole double-throw. Both are rated at 1 ampere at 125 volts direct current or 3 ampere at 125 volts, alternating current.

Check No. 22 on Reply Card for more Details

AIR CRANKING MOTOR: Leece-Neville Co., Cleveland 14, O., offers an air cranking motor for quick and dependable starting of diesel and gasoline engines. It is particularly recommended where the safety factor is important as in cases where flammable liquids or combustible atmosphere render electrical starting of power units hazardous.

Check No. 23 on Reply Card for more Details

ABRASIVE BELTS: Designed with a resin bond to provide extra durability and heat resistance, Three-M-ite resin bond cloth belts are available from Minnesota Mining & Mfg. Co., St. Paul, Minn. Made in widths up to 18 inches and lengths from 60 inches up, belts consist of aluminum oxide mineral grains, in grits from 24 to 120, coated on a flexible cloth backing with a resin bond.

Check No. 24 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

OUTLOOK— Pressure on the steel mills is easing but the producers anticipate no immediate important letup in demand for the major products. Some consuming lines have definitely cut their requirements, but the needs from other directions, especially the heavy durable goods, continue pressing. Whatever slack has appeared to date at the mill level appears to have been taken up by diverting shipments elsewhere. For that matter, there have been only a few outright cancellations, buyers, in general, continuing to take in steel for inventory even where they have reduced operations. As a result, the overall supply situation in all major products continues stringent.

BALANCE— Talk is heard increasingly demand-supply balance likely will be struck in many products before many more months pass. Some of this talk traces to virtual abandonment of the gray market by consumers except for stop-gap purchases. Also, there have been a few signs to indicate the conversion ingot market is slightly less active. This could mean the badly unbalanced supply situation is being corrected. In the main, it is thought that with the steelmakers maintaining production at the high level of past months the chances are supply conditions will show steady improvement as the year progresses.

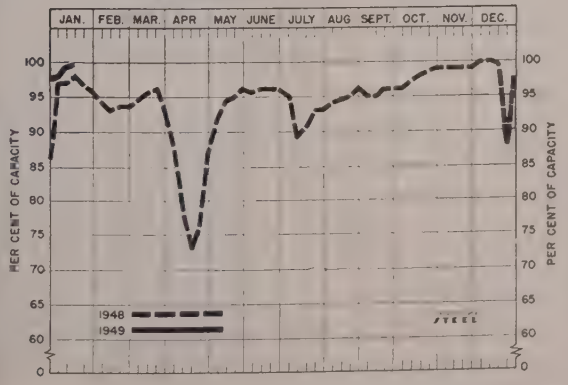
ALLOCATIONS— More than 500,000 tons of steel monthly are earmarked for distribution to certified consumers until next September. This results from voluntary action on the part of the steelmakers in extending most of the major allocation programs. Except for electrical grades and specialties, sheet producers have taken no action on allotments beyond first quarter. Several larger producers have set up April quotas of certified tonnage on all major products excepting sheets. Stainless steel producers still have tonnage available for this quarter. Under plans now being formulated, certified plate tonnage will be increased modestly. At least one producer of hot-rolled carbon bars has set up allotments on certified tonnage for April, with indications no action will be taken on noncertified tonnage requirements for at least another couple weeks.

RAW MATERIALS— Pressure for pig iron continues despite reduced foundry melt. Foundries are increasing percentage of iron in their mix, despite weakening in cast scrap prices. Weakness dominates the scrap market and the situation is as confused as a week ago, with buying at a virtual standstill. Steelmaking grades are on the lower level reported 10 days ago, and this applies to much of the so-called earmarked scrap received direct from consuming plants and which temporarily had been held at the old formula level. The tone of the market is very soft and further price cutting is expected with stocks piling up in dealer yards. Price reductions in the cast grades have been particularly sharp.

PRODUCTION— Steel production rose to another all-time high last week, scheduled operations being equivalent to output of about 1,843,516 tons compared with 1,830,600 net tons the preceding week. The national ingot rate advanced 1 point to 100 per cent of capacity.

PRICES— STEEL's arithmetical price composite on steelmaking scrap has declined further. At $41.33 it compares with $41.92 the preceding week, $42.58 for the week ended Jan. 8 and $43.25 for the period just prior to the latest downward price move. A year ago, the composite was $41.92. Due to a downward adjustment in the pig iron price at Buffalo, the composite on steelmaking pig iron has eased slightly to $46.25 from $46.29 and compares with $39.16 a year ago. Other price composites held unchanged last week and compared with those for the like week a year ago as follows: Finished steel, $97.77 and $78.41; semifinished steel, $75.75 and $65.10.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Jan. 22	Change	Same Week 1948	Same Week 1947
Pittsburgh	98.5	+ 2*	93.5	99
Chicago	99	— 0.5*	93	90
Eastern Pa.	97	+ 2	90	87
Youngstown	105	None	103	88
Wheeling	92.5	None	93.5	89
Cleveland	99.5	+ 3	94.5	92
Buffalo	104	None	88.5	90.5
Birmingham	100	None	100	99
New England	87	+ 1	83	82
Cincinnati	104	+ 5	100	91
St. Louis	84.5	+ 4.5	89.5	60.5
Detroit	104	— 1*	91	90
Estimated national rate	100	+ 1	96.5	91.5

* Revised.

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Jan. 22	Jan. 15	Month Ago Dec. 1948	Year Ago Jan. 1948	5 Years Ago Jan. 1944
Finished Steel	$97.77	$97.77	$95.50	$78.26	$56.73
Semifinished Steel	75.75	75.75	75.75	60.46	36.00
Steelmaking Pig Iron	46.29	46.29	46.29	38.50	23.00
Steelmaking Scrap	41.33	41.92	43.25	40.75	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Dec. 1948	4.11778c
Nov. 1948	4.11778c
Oct. 1948	4.12950c
Dec. 1947	3.49055c
Dec. 1943	2.38649c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. December, 1948 figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Jan. 22, 1949	Dec. 1948	Oct. 1948	Jan. 1948
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.5164	3.79	3.79	3.348
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.4918	3.48	3.48	2.966
Plates, Pittsburgh mills	3.50	3.50	3.50	2.80
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.7256	3.71	3.71	3.186
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.55
Bright basic wire, Pittsburgh	4.325	4.325	4.325	3.675
Wire nails, Pittsburgh mills	5.775	5.775	5.775	4.625
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.80	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$53.57
Slabs, Chicago	52.00	52.00	52.00	40.18
Rerolling billets, Pittsburgh	59.00	59.00	59.00	40.18
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.05c

* Nominal.

Pig Iron

	Jan. 22, 1949	Dec. 1948	Oct. 1948	Jan. 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$40.379
Basic, Valley	46.00	46.00	46.00	38.40
Basic, eastern del. Philadelphia	50.3002	50.17	50.17	41.372
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	39.879
No. 2 fdry., del. Philadelphia	50.8002	50.67	50.67	41.871
No. 2 foundry, Chicago	46.25	46.25	45.13	38.60
No. 2 foundry, Valley	46.50	46.50	43.50	36.50
Southern No. 2 Birmingham	43.38	43.38	43.38	34.88
Southern No. 2 del. Cincinnati	49.43	49.09	49.09	37.74
Malleable, Valley	46.50	46.50	46.50	38.90
Malleable, Chicago	46.50	46.50	45.38	39.10
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	50.00
Ferromanganese, f.o.b. Etna, Pa.	163.00	163.00	163.00	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.00	$42.75	$42.75	$40.30
Heavy melt. steel, No. 2, E. Pa.	39.50	41.50	41.50	42.30
Heavy melt. steel, No. 1, Chicago	39.00	41.75	41.75	39.05
Heavy melt. steel, No. 1 Valley	37.75	42.75	42.75	40.04
Heavy melt. steel, No. 1 Cleveland	37.25	42.25	42.25	39.75
Heavy melt. steel, No. 1, Buffalo	45.50	48.50	48.15	43.30
Rails for rerolling, Chicago	57.50	70.38	65.50	60.00
No. 1 cast, Chicago	57.00	70.50	70.50	63.50

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.50	$12.50
Connellsville, beehive foundry	17.00	17.00	17.00	14.60
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.19

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-$105 per gross ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill., 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.45c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

High-Strength, Low-Alloy Bars: 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich.; 4.70c, Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.

Motor: 6.70c mill except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.; 7.95c, Follansbee, W. Va., Toronto, O.; 9.20c, Brackenridge, Pa.

Dynamo: 7.50c, mill, except: 8.65c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill.; 10.00c, Brackenridge, Pa.

Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 11.80c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 12.35c, Brackenridge, Pa.; 58, 9.30c, mill except: 10.55c, Follansbee, W. Va., Toronto, O.; 13.05c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

Galvanized (No. 10), 6.75c, mill.

Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa Colo.; 5.90c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Corn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo., Atlanta, Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa ; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $6.75 per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113, Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50-28.75	30.50-32.00	37.50-40.75
302	28.50-28.75	33.00-33.75	37.50-40.75
303	31.00-31.50	36.50-39.75	39.50-43.00
304	30.00-31.25	35.00-35.75	39.50-43.00
316	46.00-48.00	55.00-57.25	53.00-57.25
347	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410	22.75-23.00	26.50-27.00	32.00-33.00
416	23.25-23.50	28.25-33.50	32.50-33.50
430	23.25-23.50	27.00-27.50	34.75-35.50
446	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

	Plates —Cladding—		Sheets —Cladding—	
	10%	20%	10%	20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Gal.	In.	Butt Weld Blk.	Gal.
⅛	39½-	8½-	1	46-	25-
	41½	12½		48½	27½
¼	37½-	9½-	1¼	46½-	25½-
	39½	14		49	28
⅜	34-	4½-	1½	47-	26-
	36	9		49½	28½
			2	47½-	26½-
½	40½-	18-		50	29
	43	21½	2½, 3	48-	27-
¾	43½-	22-		50½	29½
	46	24½	3½ & 4	44½	22½

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2	39½	17½	38½	16½	27-	5-
					38½	17
2½	42½-	20½-	41½	19½	32½-	10½-
	43½	21½			41½	20
3	42½-	20½-	41½	19½	35-	13-
	43½	21½			41½	20
3½&4	42½-	20½-	43½	21½	38½-	16½-
	46½	24½			43½	22
5 & 6	42½-	20½-	43½	21½	38½-	16½-
	44½	22½			43½	22
7	....	....	....	....	43¾	20½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Gal.	In.	Butt Weld Blk.	Gal.
⅛	40½	....	1¼	46-	26-
¼	38½	....		48	27
⅜	35	....	1½	46½-	26½-
½	40-	18½-		48½	27½
	42	19½	2	47-	26½-
¾	43-	22½-		49	28
	45	23½	2½ & 3	47½-	27-
1	45½-	25½-		49½	28½
	47½	26½	3½ & 4	43½	....

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2	38½	16½	37½	15½	26-	4-
					37½	16
2½	42½	20½	40½	19½	31½-	9½-
					40½	19
3	42½	20½	40½	19½	34-	12-
					40½	19
3½-4	41½-	20-	42½	20½	37½-	15½-
	45½	23½			42½	21
5 & 6	41½-	20	42½	20½	37½-	15½-
	43½				42½	21
8	45½	....	44½	21½-	40½-	17½-
				22	44½	22
10	45	....	44	21-	41½-	18½-
				21½	44	21½
12	44	....	43	20	40½-	17½-
					43	20½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Gal.	In.	Lap Weld Blk.	Gal.
⅜	+59½	+95½	1¼	+22	+53
½	+20½	+52½	1½	+15½	+45½
¾	+10½	+41½	2	+ 7½	+36½
1 and			2½-3½	+ 5	+32
1¼	+ 4½	+32½	4	List	+26
1½	— 1½	+29	4½-8	+ 2	+27½
2	— 2	+28½	9-12	+12	+37

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24"; inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	.....	13.39-14.64	13.00	13.00
1¼	13	.....	15.87-17.34	13.21	15.39
1½	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2¼	13	23.36	25.16-27.50	20.73	24.40
2¼	12	23.54-25.73	27.70-30.28	22.83	26.88
2½	12	25.79-28.19	30.33-33.15	25.02	29.41
2¾	12	27.33-29.87	32.14-35.13	26.51	31.18
3	12	28.68-31.35	33.76-36.90	27.82	32.74
3¼	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.85-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	....	....
5	9	68.28-74.64	80.35-87.82	....	....
6	7	104.82-114.57	123.33-134.81	....	....

Pipe, Cast Iron: Class B, 6-in. and over, $98.50 per net ton, Birmingham; $106.70, del. Chicago; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb. mill, except: $3.50, Indiana Harbor, Ind., and Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $5.10 per 100 lb., Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Philadelphia, del.	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.43	....	....
Buffalo, furnace	*47.00	*47.00	*47.50	48.00
Boston, del.	56.20	56.20	56.70	....
Rochester, del.	49.35	49.35	49.85	50.35
Syracuse, del.	50.2065	50.2065	50.7065	41.2065
§**Chicago,** district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
§**Chicago, district** furnaces	46.00	46.00-46.50	46.50	47.00
Akron, del.	48.17	48.67	48.67	49.17
Lone Star, Tex., furnace	....	†75.00	....	....
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.75	53.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	....	46.50	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	46.00	46.00	46.50	47.00
Cincinnati, del.	50.55	51.05	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	49.87	50.37	50.37	50.87

* Republic Steel Corp. quotes 50 cents a ton higher for basic, No. 2 foundry and malleable at Buffalo.

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base).$59.50
6.51-7.00.. 60.75 9.01- 9.50. 67.00
7.01-7.50.. 62.00 9.51-10.00. 68.25
7.51-8.00.. 63.25 10.01-10.50. 69.50
8.01-8.50.. 64.50 10.51-11.00. 70.75
8.51-9.00.. 65.75 11.01-11.50. 72.00

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $84.75 furnace, Niagara Falls; $84 open-hearth and $85 foundry grade, Keokuk, Iowa. Piglets, Si 16%, $91, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ..$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., $54; Buffalo, Troy, N. Y., $50; Philadelphia, $56.9786 delivered.

Intermediate phosphorus, Central furnace, Cleveland, $51.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace..	$13.50-15.50
Connellsville, foundry..	16.00-18.00
New River, foundry	16.50
Wise county, foundry..	15.35
Wise county, furnace..	14.60

Oven Foundry Coke

Kearney, N. J., ovens..	$22.00
Everett, Mass., ovens..	
New England, del.‡.	23.35
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
Indianapolis, ovens	20.85
Chicago, del.	24.19
Cincinnati, del.	23.66
Detroit, del	24.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens..	20.90
Buffalo, del.	23.39
Cleveland, del.	22.55
Erie, del.	22.67
Birmingham, ovens	17.70
Philadelphia, ovens	21.05
Swedeland, Pa., ovens.	21.00
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chamicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia	$45.00

Per pound, ovens

(Effective as of Oct. 1)

Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50

(Effective as of Oct. 25)

Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O. $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91, chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$2

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York-Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland Oreg., and/or Tacoma, Wash. (S S paying for discharge; dr basis, subject to penalties guarantees are not met.)

Indian and African

48% 2.8:1	$37.5
48% 3:1	39.0
48% no ratio	31.0

South African (Transvaal)

44% no ratio	$25.50-$26.0
45% no ratio	26.5
48% no ratio	29.00-30.0
50% no ratio	29.50-30.5

Brazilian—nominal

44% to 2.5:1 lump	$33.0

Rhodesian

45% no ratio	$27-$27.5
48% no ratio	30.0
48% 3:1 lump	39.0

Domestic (seller's nearest rail)

48% 3:1	$39.0

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ⅝" & Thicker
Boston (city) ..	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try) .	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.73	6.58	8.67	5.52-5.78	5.98	7.48
New York(c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.53	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)...	5.72	6.64	7.53-7.58	5.49-5.59	...	5.60	6.34	8.40	5.25	5.53	6.76-7.19
Phila. (c'try)..	5.57	6.59	7.38-7.43	5.34-5.44	...	5.45	6.19	8.25	5.10	5.38	6.61-7.04
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Wash. (w'hse).	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)..	5.00	5.90	7.80	5.71	6.50	5.20	6.05	10.10	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.65	5.56	6.35	5.05	5.90	9.95	5.10	5.35	6.91
Pitts. (w'hse)..	4.85-5.00§	5.75-5.85[8]	7.15-7.70	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse).	4.85-5.00§	5.75-5.85[8]	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90‡‡	5.90-6.29	7.34-8.00‡‡	5.17-5.69	6.45-6.85	5.30-5.35	6.05-6.10	8.24-8.54	5.34-5.60	5.50-5.55	6.95-7.00
Cleve. (w'hse).	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.30-6.70	5.15-5.20	5.90-5.95	8.09-8.39	5.19-5.45	5.35-5.40	6.80-6.85
Cincin. (w'hse).	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city).	5.20	5.90‡[8]	7.30	5.00	6.67-6.80	5.05	5.85	8.25[9]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05	5.75‡[8]	7.15	4.85	6.52-6.65	4.90	5.70	8.10[9]	4.90	5.10	6.55
Milwaukee (city)	5.38	6.08‡[8]	7.48	5.18	6.82-6.98	5.23	6.03	8.43[9]	5.23	5.43	6.88
St. Louis (del.)	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41-7.66
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26-7.51
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
L. A. (w'hse) .	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco .	5.95[21]	7.15	8.05	6.75[21]	8.25[15]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma .	6.35[17]	7.90[8]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller ; up to 6 in. in length.	35 off
⅝ and ⅝ x 6-in. and shorter.	37 off
¾-in. and larger x 6-in. and shorter..	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter....	40 off
¾, ⅞, & 1 x 6-in. and shorter.....	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

FERROALLOY PRODUCT PRICES

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $62, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price; $165, Rockwood, Tenn.; $162, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, Sheridan, Pa.; $163, Aetna, Pa. Shipment from Pacific Coast warehouses by one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 f.o.b. Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound. F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.65c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

(*Please turn to Page* 118)

Demand for Metals Remains Active

Actual transactions are restricted, however, by scarcity of offerings and resistance of buyers to premium-priced offerings. Secondary aluminum ingot prices decline

New York—Demand for major nonferrous metals remained heavy last week, although actual transactions were light due to scarcity of offerings and resistance of consumers to premium-priced metal, chiefly imported supplies. Weakness in secondary aluminum ingot prices again featured the markets pricewise.

Copper — No progress has been made in negotiations to end the strike at Kennecott Copper Corp.'s Utah properties, curtailing supplies for the 13th consecutive week. The loss in production since the strike began on Oct. 24 has been estimated at more than 80,000 tons.

Production of crude copper from primary sources amounted to 54,362 tons in December while output from secondary sources totaled 9726 tons. These figures show moderate increases over November when output amounted to 51,141 tons and 7156 tons, respectively. Production of refined copper amounted to 96,117 tons in December compared with 102,779 tons in November. Stocks of refined copper at refineries at the end of December amounted to 96,080 tons, an increase of 6300 tons. These stocks may include a large tonnage being held for subsequent transfer to the government stockpile. For the full year, primary production totaled 849,815 tons against 871,391 tons in 1947; secondary output, 130,320 tons against 105,307; refinery output, 1,233,697 tons against 1,196,393; domestic deliveries, 1,344,445 tons against 1,383,666 tons in 1947.

Lead—The amount of lead available for February delivery will approximate that for the present month. Demand for European lead at premiums has tapered markedly since consumers are not willing to pay more than the domestic market for such supplies. Secondary refined lead, which commanded a premium late in 1948, also has declined to the level quoted by domestic producers of primary metal.

National Lead Co. has reduced prices of lead traps and bends and of combination lead and iron bends and ferrules, and drum traps from the basis of "list plus 80 per cent" to "list plus 70 per cent," effective as of Jan. 17.

Zinc—There has been no noticeable letup in demand for zinc in the domestic market. Producers continue to allocate available supplies as equitably as possible among their customers, despite reports that some die casters have curtailed operations recently. Prime western continued to sell at 17.50c, East St. Louis, and around 18.00, f.a.s. Gulf ports.

Tin—Stocks of pig tin held by the Office of Metals Reserve which were available for sale at the end of December amounted to 24,322 tons, a decline of 22,132 tons from the 46,454 tons held on Nov. 30. This reveals that a large tonnage, probably 24,077 tons, was transferred to the permanent stockpile last month. At the beginning of the year, OMR stocks totaled 24,555 tons.

Total receipts for 1948 totaled 85,631 tons while the allocations came to 62,411 tons. A certain amount of off-grade Siamese tin which was allocated in November will be deducted from the recipients' allocations in 1949, and, hence, the consumption of primary tin last year was about 60,000 tons.

Aluminum—Smelters of remelt aluminum ingots have reduced prices due to light volume of business being entered on books. Shipments, however, continue to move in good volume. Buying in the steel deoxidizing grades is said to be practically nil.

Foresees High Silver Use

New York—General recovery in world conditions and the improvement in dollar shortages resulting from grants and loans by the United States government failed to make themselves felt in the silver markets during 1948, according to the annual silver market review issued by Handy & Harman, this city. Isolation remained relatively complete among the three main centers. Purchases in New York by foreign buyers were severely limited by exchange restrictions and those foreign sellers willing to accept sterling were attracted to London by higher prices. Bombay meanwhile continued to operate on an almost completely internal basis.

Prices in the New York market were unusually stable, ranging from a high of 77.75c per troy ounce to a low of 70.25c. Imports have become the measure of available supplies and amounted to about 96 million ounces in 1948. Net reduction in current supplies due to exports probably amounted to only about 2 million ounces.

Production in the western hemisphere amounted to about 121 million ounces during 1948, showing little change from the revised 1947 total of 121,800,000 ounces.

Prospects for 1949 were outlined by Handy & Harman as follows:

"The situation at the close of 1948 shows remarkable similarity to that existing a year ago. It has been demonstrated that industrial demand in the United States, even at present high levels, is inadequate over a period of time to absorb all supplies offered without additional support. This support has once again come from the Bank of Mexico, and we believe that the bank's future policy will be the key to the 1949 market. There appears to be little prospect for any early relaxation of exchange controls in other centers, and their silver operations in all probability will have little influence on conditions here during the coming year. On the other hand, we do not foresee any material change in this country's domestic silver policy, and hence United States production will not become a factor.

"Indications are that business activity will continue at high levels at least for the next few months. If this is so, consumption of silver by the arts and industries should be maintained near the present rate. The Bank of Mexico has indicated a willingness to absorb all Mexican production during January for coinage purposes, and there is a good possibility that this policy may be continued, at least in part, during subsequent months. Under these circumstances we believe that the price of silver in New York will be maintained close to the present level. However, if the bank should withdraw its support and no compensating changes were to take place in the demand or supply picture, we cannot see how lower prices for silver can be avoided."

Europes Metal Needs Probed

Washington — Economic Co-operation Administration will send a mission to Europe to decide the "irreducible needs" for metals of European countries, principally Britain, Belgium and the Netherlands. This move was made following a controversy over heavy European shipment of scrap aluminum and lead into this country while the United States financed supplies of the scarce virgin metals for Europe. ECA investigation of the charges indicates that much of the incoming metal did not come directly from the countries named but was "transhipped" through them from other points. Government statistics had revealed that American imports of the scrap assumed a large volume in June, 1948, "about the time when ECA-financed shipments began."

Freight Car Deliveries Gain

New York—Domestic freight car orordrs in Deember totaled 8368 cars, bringing the total for the year up to 97,184 against 121,308 in 1947 and 67,193 in 1946, according to the American Railway Car Institute. Of the December total 4968 were placed in commercial shops and 3400 in railroad shops.

Deliveries last month amounted to 9967 for the third largest monthly figure of the year. The November figure was 9283.

Deliveries of 112,634 cars in 1948 were the heaviest since 1924 and compared with 68,552 in 1947 and 41,955 in 1946. Principal types of freight cars delivered in 1948 were box, 40,201; gondolas, 13,587; hoppers, 41,113; refrigerator cars, 8049; and tank cars, 6831. Chief types of cars ordered during the year were: Hoppers, 40,693; gondolas, 19,328; box cars, 18,940; refrigerator cars, 7060; and tank cars, 4464.

Total backlogs as of Jan. 1, 1949, involved 103,896 cars, against 119,786 a year earlier and a high for 1948 of 134,676 on May 1.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley: Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 20.50-22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

Lead: Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 25.25-25.75c; No. 12 foundry alloy (No. 2 grade) 24.50-25.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.25-27.75c; grade 2, 25.50-26.00c; grade 3, 24.50-25.00c; grade 4, 23.75-24.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb. and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $90-$97 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.10.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 70.00c per ounce.

Platinum: $88-$92 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$115 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 37.18; yellow brass 34.59; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 38.16; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

Seamless Tubing: Copper 37.22; yellow brass 37.60; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

Wire: Yellow brass 34.88; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	49.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, $27.25 per cwt; cut coils, $27.50. Traps and Bends: List price plus 70%.

ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb., 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb. 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 3 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb. 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 39.25c, f.o.b. Cleveland; 39.00c, Detroit; 38.00c, f.o.b. Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.875	18.625	18.125
Commercial Bronze			
95%	20.250	20.000	19.500
90%	20.125	19.875	19.375
Red brass			
85%	20.000	19.750	19.250
80%	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal	18.250	18.000	17.500
Nickel, silver, 10%	20.250	20.000	10.000
Phos. bronze, A	22.625	22.375	21.375
Naval brass	18.750	18.500	18.000
Manganese bronze	18.750	18.500	17.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 19.50-20.00, No. 2 copper 18.50-19.00, light copper 17.50-18.00, composition red brass 15.50-16.00, auto radiators 13.50-13.75, heavy yellow brass 11.75-12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.50, No. 2 copper 19.50, light copper 18.50, refinery brass (60% copper), per dry copper content 18.37½-18.62½.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 18.50-19.00, No. 2 17.50-18.00, light copper 16.50-17.00, No. 1 composition red brass 14.25-14.50, No. 1 composition turnings 13.50-13.75, mixed brass turnings 8.75-9.00, new brass clippings 15.75-16.25, No. 1 brass rod turnings 12.75-13.25, light brass 8.25-8.50, heavy yellow brass 10.50-10.75, new brass rod ends 13.25-13.75, auto radiators, unsweated 12.75-13.00, cocks and faucets 12.25-12.50, brass pipe 12.75-13.25.

Lead: Heavy 18.50-19.00, battery plates 11.00-11.50, linotype and stereotype 19.50-20.00, electrotype 18.50-19.00, mixed babbitt 19.50-20.00, solder joints, 23.00-24.00.

Zinc: Old zinc 9.50-10.00, new die cast scrap 9.50-10.00, old die cast scrap 6.00-6.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 15.50-16.00, old sheets 12.00-12.50, crankcase 12.00-12.50, borings and turnings 6.00-6.50, pistons, free of struts, 12.00-12.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Dec. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Nov. Avg.	23.50	21.325	16.580	103.00	17.00	38.50	40.00	73.655
Jan. 3-20	23.50	21.30–21.35	17.50	103.00	17.00	38.50	40.00	70.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Hvy. Melt.	$41.00-43.00†
No. 2 Hvy. Melt.	41.00-43.00†
No. 1 Bundles	41.00-43.00†
No. 2 Bundles	41.00
No. 3 Bundles	39.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	38.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-49.00
Low Phos. Steel	47.00-49.00
Heavy Turnings	39.00-40.00

Cast Iron Grades§

No. 1 Cupola	58.00-60.00
Machinery Cast	65.00-66.00
Charging Box Cast	55.00-56.00
Heavy Breakable Cast	54.00-55.00
Malleable	68.00-70.00
Brake Shoe	51.00-52.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	73.50-75.50
Axles	55.25-56.25
Rails, Rerolling	59.00-60.00
Rails, Random Lengths	55.00-56.00
Rails, 3 ft and under	58.00-59.00
Rails, 18 in. and under	60.00-61.00
Railroad Specialties	56.00-57.50
Uncut Tires	55.00-56.00
Angles, Splice Bars	57.00-58.00

† Dealer open hearth grades, $41; Industrial, $41-43. § Nominal.

CLEVELAND

No. 1 Heavy Melt. Steel	$37.00-37.50
No. 2 Heavy Melt. Steel	37.00-37.50
No. 1 Busheling	37.00-37.50
Nos. 1 & 2 Bundles	37.00-37.50
Machine Shop Turnings	32.00-32.50
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings	34.50-35.00
Cast Iron Borings	33.00-33.50
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Heavy Turnings	37.00-37.50
Alloy Free Turnings	36.00-36.50
Cut Structurals	45.00-45.50

Cast Iron Grades

No. 1 Cupola	$65.00-65.50
Charging Box Cast	57.00-57.50
Stove Plate	57.00-57.50
Heavy Breakable Cast	52.00-52.50
Unstripped Motor Blocks	53.00-53.50
Malleable	72.00-72.50
Brake Shoes	53.00-53.50
Clean Auto Cast	68.00-68.50
No. 1 Wheels	60.00-60.50
Burnt Cast	52.00-52.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00
R.R. Malleable	73.00-75.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	56.00-58.00
Rails, 3 ft and under	60.00-62.00
Cast Steel	53.00-54.00
Railroad Specialties	52.00-54.00
Uncut Tires	50.00-52.00
Angles, Splice Bars	58.00-59.00

VALLEY

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles	37.50-38.00
Machine Shop Turnings	32.00-32.50
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	33.50-34.50
Low Phos.	46.00-48.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$36.40
No. 2 Heavy Melt. Steel	36.40
No. 1 Busheling	36.40
Nos. 1 & 2 Bundles	36.40
Machine Shop Turnings	31.40
Mixed Borings, Turnings	31.40
Short Shovel Turnings.	33.40
Cast Iron Borings	32.40

Cast Iron Grades

No. 1 Cupola Cast	58.00
Charging Box Cast	51.00
Heavy Breakable Cast.	50.00
Stove Plate	48.00
Unstripped Motor Blocks	48.00
Brake Shoes	45.00
Clean Auto Cast	58.00
Drop Broken Cast	63.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00
R.R. Malleable	68.00
Rails, Rerolling	56.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	60.00

DETROIT

(Brokers' Buying prices, f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	54.00-59.00
Clean Auto Cast	60.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
Nos. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Cast Iron Borings	36.00-36.50
Short Shovel Turnings.	37.00-37.50
Low Phos.	43.00-45.00

Cast Iron Grades

No. 1 Cupola	58.00-60.00
Mixed Cupola	55.00-58.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	65.00-66.00

Railroad Scrap

Rails, 3 ft. and under.	58.00-59.00
Railroad Specialties	54.00-55.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$43.00
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
No. 3 Bundles	nom.
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	36.00-37.00
Bar Crop and Plate	46.00-47.00
Punchings & Plate Scrap	46.00-47.00
Cut Structurals	46.00-47.00
Elec. Furnace Bundles.	44.00-45.00
Heavy Turnings	43.00-44.00
No. 1 Chemical Borings	nom.

Cast Iron Grades

No. 1 Cupola Cast	54.00-55.00
No. 1 Machinery Cast.	56.00-57.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	50.00-51.00
Unstripped Motor Blocks	51.50-52.50
Clean Auto Cast	54.00-55.00
No. 1 Wheels	57.00-58.00
Malleable	nom.

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$36.00-36.50
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling	34.00
Nos. 1 & 2 Bundles	34.00
No. 3 Bundles	32.00
Machine Shop Turnings	29.00
Mixed Borings, Turnings	29.00
Short Shovel Turnings.	30.00
Punching & Plate Scrap	41.00-42.00
Cut Structurals	41.00-42.00
Elec. Furnace Bundles.	41.00-42.00

Cast Iron Grades

No. 1 Cupola Cast	49.00
Charging Box Cast	49.00
Heavy Breakable	40.00
Unstripped Motor Blocks	46.50
Malleable	66.00-67.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$35.00
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	29.00-30.00
Bar Crops and Plate	37.50-38.50
Punching & Plate Scrap	37.50-38.50
Chemical Borings	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-56.00
Heavy Breakable Cast	49.00-50.00
Stove Plate	48.00-49.00
Unstripped Motor Blocks	46.00-48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.00-40.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles	38.00-40.00
No. 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	34.50-35.00
Cast Iron Borings	33.50-34.00
Bar Crops and Plate	44.00-45.00
Punchings	44.00-45.00
Elec. Furnace Bundles.	42.00-43.00
Heavy Turnings	38.50-39.00
Cut Structurals	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	56.00-58.00
Clean Auto Cast	56.00-58.00
No. 1 Wheels	54.50-55.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-44.00
Malleable	71.00-72.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	47.00-48.00
Rails, 3 ft. and under.	53.00-54.00
Rails, 18 in. and under	56.00-57.00
Railroad Specialties	46.00-47.00
Angles, Splice Bars	51.00-53.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	39.00-40.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 Cupola Cast	50.00-52.00
Mixed Cast	48.00-49.00
Heavy Breakage Cast.	50.00-51.00
Brake Shoes	50.00-52.00
Clean Auto Cast	55.00-57.00
Burnt Cast	51.00-52.00

Railroad Scrap

R.R. Malleable	64.00-65.00
Rails, Rerolling	55.00-56.00
Rails, Random Lengths	48.00-49.00
Rails, 3 ft. and under.	53.00-54.00
Uncut Tires	44.00-45.00
Angles, Splice Bars	47.00-49.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	nom.
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft. and under.	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$27.50
No. 2 Heavy Melt. Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-65.00

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

*F.o.b. California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
Nos. 1 & 2 Bundles	29.00-30.00
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punching & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	50.00
Heavy Breakable Cast	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	20.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	$37.50-42.50

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00-50.00
No. 2 Cast	44.00-45.00

*Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

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versus
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Sheets, Strip . . .

Sheet Prices, Page 94

Some producers booking in next quarter on special grades. No action yet on majors

New York—While it is still too early for sheet producers to take action on the major grades, there is an increasing disposition to set up quotas for shipment beyond the end of the current quarter on some of the specialties. One producer recently opened books on electrical sheets for April; another producer has just set up quotas for the entire first period. There is also some booking for second quarter shipment of stainless steel strip and certain coated grades, with galvanized an important exception.

Boston—Mild wave of cutbacks and deferments, hardly a ripple at mill level, has ebbed and some tonnage has been reinstated. Nevertheless, pressure for flat-rolled is gradually easing. More inventories are in better balance due in part to the somewhat lower end-use demand for light consumer goods. Stove and range builders' inventories of flat-rolled products consist substantially of cold-rolled sheets, substituted for enamelling stock with questionable success. However, there is no indication of an early improvement in enamelling sheet supply. Additional mill volume is being scheduled for April; electrical sheets and strip in coils, for entire first quarter. Most products moved from a quarterly to a monthly basis for the first quarter and will continue in that pattern of distribution for the second quarter. Although most galvanized tonnage for grain storage bins is certified to western mills, no additional volume of zinc-coated stock is likely in near future. Slackening demand has opened scattered holes in cold-strip schedules, and nonintegrated mills, still lacking balance and needed volume of hot-rolled, are readjusting schedules with some difficulty.

Philadelphia—While the warm air heating and steel house programs, involving close to 40,000 tons of sheets per month in the aggregate, have not been recommended for extension, more than 8000 tons of galvanized sheets per month for grain bins have been largely agreed upon for a period of six months, beginning March, and the question of steel for prefabricated houses is still under consideration. Interested government agencies have been greatly disappointed over the development of the housing program to date, and if convinced that moderate priced dwellings can be prefabricated, will likely exert considerable pressure for steel for this purpose. Allotments of such steel, ranging from 12,000 to 15,000 tons per month, have been proposed by builders.

Except for electrical grades and specialties, sheet producers have as yet taken no action on allotments beyond first quarter. One large producer within the past week has set up April quotas of certified tonnage on all major products excepting sheets.

Chicago — In spite of numerous manufacturing curtailments, the steel industry reaffirms each week the existence of demand above its ability to satisfy. As a matter of fact, demands upon mills for flat-rolled carbon products are intensified by the advent of a competitive market for many consumer products, pressure mounting as gray market and conversion steel increasingly is priced beyond reach. These premium-priced sources are still active but not to the degree of a few months ago.

The tight galvanized sheet picture will worsen in March when shipments to the grain storage bin program start, and with many manufacturers of these units located in the Midwest, noncertified galvanized consumers here will get less steel. It is understood the major portion of tonnage going to the program will be deducted from other consumers' quotas, since bin storage manufacture up to now has been less attractive than manufacture of other products which require less steel.

New coating extras, more accurately reflecting the varying amounts of spelter used in producing the various gages of galvanized sheets and forms of roofing and siding, were put into effect by Inland Steel Co., Chicago, on Jan. 17. Flat sheet coating extras have previously been uniform within a range of gages; the new card abolishes the ranges, and sets up an extra for each gage. For example, at the current price of prime western zinc the old extra card quoted 33 cents per 100 lbs for coating of 9-14 gage sheets. The new card lists 9, 10, 11, 12, 13 and 14 gage sheet extras, respectively, of 29c, 31c, 35c, 39c, 42c and 46c.

Pittsburgh—Demand for sheets and strip shows no signs of easing throughout this quarter at least. There has been a slight increase in the number of companies who have declined to take their full mill allotments, but the excess tonnage has quickly been absorbed by other consumers. Some steel producers are following the practice of telling their customers that this excess tonnage resulting from spot order cancellations will not affect a particular company's future monthly quotas, if accepted.

Two other producers have followed Republic Steel's action in establishing galvanizing coating extras, which recognizes the variation in the amount of zinc required in coating the various gages.

Crucible Steel Co. of America reduced its stainless steel extras, effective Jan. 14. The company's new quotations are generally in line with those quoted by members within the industry. In addition to revision in extras, the company's price list shows a reduction in the base price for forging billets from the list published Aug. 25.

Cleveland—Production cutbacks in some industries have given rise to belief among consumers that some finished steel tonnage is being freed and they are contacting steel company sales offices in an effort to obtain some of it. In most instances plants are looking upon production cutbacks as an opportunity to at last build an inventory. Consequently, little, if any, tonnage is available for diversion to other consumers.

St. Louis—Extreme pressure on sheets is dropping somewhat. Mills report that back-ups in the electrical appliances and vending machine fields are resulting in scattered sheet cancellations by manufacturers. Tonnage involved is trifling, and the space on rolling schedules is filled immediately by reallocations through district offices. Mills regard the softening as significant, however.

St. Louis production continues a moderate rise, with the first 16 days of January indicating the month would top the all-time record established in December. Ingot production at Granite City Steel Co. through Jan. 16, for example, was 26,500 tons as compared to 25,700 tons in the same period in December.

Cincinnati—Tonnage of sheets involved in cutbacks, as operations of some consumers are trimmed, is not sufficient to create an easier supply situation. Needs of some principal sheet users are far from being satisfied, and pressure for more liberal allotments is constant. Any lightening of first-quarter schedules, because of smaller shipments to makers of household appliances, for example, might enable mills to work toward smaller carryover this quarter.

Birmingham—Sustained demand for sheets continues. Most interests believe other products will be generally available in greater quantity before the supply situation in sheets improves materially.

Los Angeles—Softening of the requirements of some sheet and strip consumers, among them the appliance manufacturers, has not noticeably affected overall demand. All tonnage that becomes available is promptly absorbed. Needs of fabricators for flat-rolled steel are still far ahead of the industry's ability to produce. In extremely short supply are galvanized and heavy-gage hot-rolled sheets.

San Francisco — Despite growing caution by small fabricators, demand for sheets and strip is as great as ever and supplies still continue far under requirements. Galvanized sheets are in shortest supply. Shipments of finished products from eastern mills still are lagging, although Bethlehem has been shipping some hot-rolled sheets to jobbers here from its eastern plants. Columbia Steel Co.'s new rolling mill has increased sheet supply only slightly as it now is working about 70 per cent on tinplate.

Wire . . .

Wire Prices, Page 95

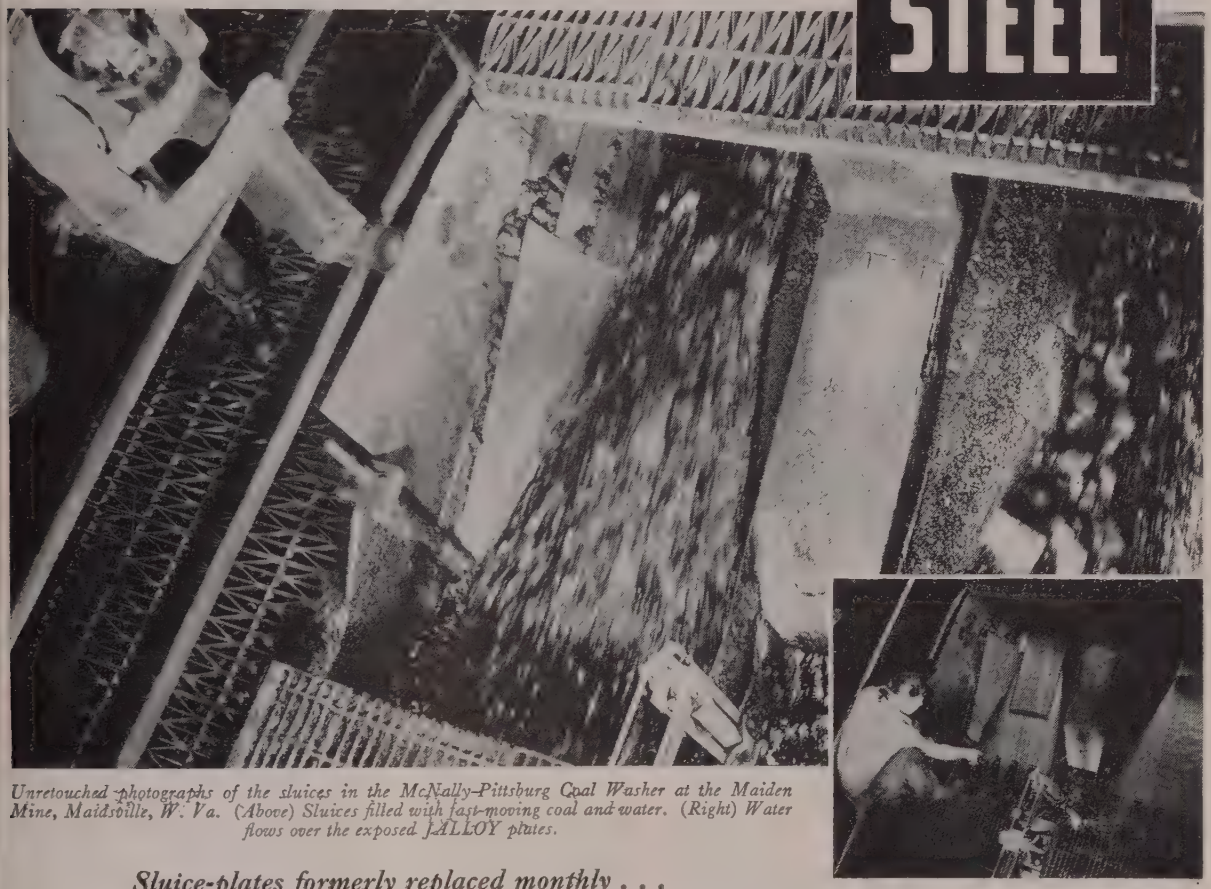
Pittsburgh—Output of merchant and manufacturers' wire products continues to fall far behind customers' stated requirements. However, seasonal influences, for the first time in years, are having a retarding effect on new order volume, suggesting that in some instances at least inventory pipe lines are in better balance with projected production schedules at users' plants. Upward price adjustments on base and extras for galvanized wire items, to reflect higher zinc costs, have not yet been adopted by some major pro-

Kelly's Creek Colliery Company

solves a costly maintenance problem with

J&L HEAT-TREATED JALLOY STEEL

J&L STEEL



Unretouched photographs of the sluices in the McNally-Pittsburg Coal Washer at the Maiden Mine, Maidsville, W. Va. (Above) Sluices filled with fast-moving coal and water. (Right) Water flows over the exposed JALLOY plates.

Sluice-plates formerly replaced monthly . . .
Now heat-treated JALLOY plates last 10 times as long

Slide 300 tons of coal *an hour*—day in and day out—down the steel sluices of a coal washer, and you would *expect* the bottom plates to wear out rapidly. Kelley's Creek Colliery Company* considered monthly replacements quite normal for sluice bottom-plates—until they put in J&L *heat-treated* JALLOY Steel. Now they get 10 times longer service. This means lower maintenance cost . . . higher profits.

But that's not all! Conveyor sides and bottoms of mild steel generally lasted 3 months at the most. A year ago JALLOY plates were installed . . . Present indications are that these plates will be in service at least *another year* before replacement is necessary. That will mean a minimum of *8 times* longer service.

JALLOY is a heat-treated, manganese-molybdenum steel developed by J&L for just such uses as these —for resisting extreme abrasion and heavy shock.

Manufacturers and maintenance men, alike, find that JALLOY heat-treated plate makes equipment last longer. The outstanding wear-resistant properties of this *modern* steel have been proved again and again in such applications as: Bulldozers . . . Scrapers . . . Rock crushers . . . Power-shovel buckets . . . Dump cars . . . Truck bodies . . . and Sand-blast equipment.

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ducers.

Birmingham—Not much change is indicated in demand for manufacturers wire which is reported to be in reasonably good supply. Most other wire products, however, including fencing and nails, remain in short supply. Jobbers report stocks exceptionally low and are pressing for additional allocations in view of the renewed agricultural demand ahead.

Plates . . .

Plate Prices, Page 95

New York—Plates continue to rank as one of the scarcest of all steel products. In fact, there is question in the minds of some steel traders if plates are not fully as stringent as sheets, strip and pipe. Most mills have again overbooked on quarterly output and look for a further downward revision in noncertified quotas for the second quarter, especially in view of the heavier tonnage which likely will be scheduled for voluntary allocation programs. At the same time, there are some who look for a general easing in demand for steel in the second half, with the possibility that plates will be no exception.

Boston—Of major steel products, plates are likely to be the last brought into supply-demand balance and this is not expected to occur this year. Mounting certified tonnage and commitments for pipe lines erase any material easing. First relief may come from railroad car building shops, now accounting for 250,000 tons monthly of which around 115,000 tons are plates. Even this is conjectural. Delivery on general distribution plate orders are three months behind schedule in some cases. Despite reduced allocations and blank-outs, mills will not become current by April, their earlier goal.

Philadelphia—Under plans now being formulated, certified plate tonnage during the proposed 6-month extension period will be increased only modestly. However, some programs are still under consideration, which may eventually boost the tonnage fairly substantially. Oil storage tanks, as distinguished from the tank and oil field program on which agreement was recently reached for increasing allotments to 18,530 tons from 16,530 at present, may come in for certification.

Chicago—One district tank fabricator has expressed concern not only over the lack of new inquiries, but also over the rising rate of cancellations for orders already received. For the noncertified plate user, the present steel shortage is probably at an all-time high. Even for maintenance purposes, plates are next to impossible to obtain. A number of railroads have announced cutbacks in employment and in repair programs as the result of the lower trend in carloading so slight relief for other plate users may be in prospect.

Birmingham—No let up is indicated in the admitted stringency in plates, Indications are that more tonnage will be diverted to voluntary allocation. Fabricating interests and others complain about what they call self-dealing by mill interests.

Los Angeles—Municipal construction in southern California, particularly for new or expanded water facilities, has spurted since beginning of the year, adding considerably to the already vast demand for plates. Required for these projects are heavy pipe and storage tanks, as well as pumping equipment. Many municipal jobs have been shelved for extended periods, awaiting lower prices in some cases, better deliveries in others. In additional instances, projects have been stalled because contracts were not available without escalator clauses, and many cities are prevented by law from accepting these. Apparently municipalities now believe that prices will remain fairly stable, and see no general decreases in the offing.

San Francisco — No letdown is expected in demand for plates. Channeling of large amounts ino heavy pipe fabrication for oil and natural gas lines continues to keep supplies stringent.

Seattle — Plates continue critical, handicapping fabricators in bidding for the larger jobs. However, one plant reports recent offers of plates and shapes from a California firm at jobbers' prices. The situation is somewhat easier due to a desire to move surplus materials of some types and to reduce inventories of items which cannot be immediately absorbed.

Tubular Goods . . .

Tubular Goods Prices, Page 95

Boston—Allocation of merchant steel pipe to distributors for the second quarter is for most part at unchanged levels; one mill blanking out one month this quarter returns to quotas for all three next quarter. Demand for pipe holds in excess of supply with slight easing in pressure. This is reflected by field engineers exerting less pressure on home offices for help in procurement, indicating they are more successful in buying near the project. Inventories of fittings, including unions, are out of balance with pipe supply and are becoming burdensome with some distributors and producers. Utilities are shopping for steel pipe, one inquiry including close to 2800 feet, 12-inch, seamless for a gas line, Fall River, Mass.

Los Angeles—Still in extremely tight supply, second only to plates, some items of tubular goods are under as much pressure as ever. In other instances, however, a little improvement is noted. In fabricated pipe for example, although demand is huge, delivery generally is being promised in six months or less, where heretofore it was 18 months to two years. Requirements of oil fields and utilities for tubular materials continue as heavy as ever, particularly for small-diameter pipe.

San Francisco — Stainless steel tubes are in ample supply, but shortage continues in pipes and other tubular products. Demand remains heavy.

Seattle — Demand for cast iron pipe is fair, but increased interest is expected as soon as seasonal conditions improve. Bids for 375 tons of 8 and 12-in. cast iron pipe for Portland airport will be received Jan. 25. The largest tonnage pending is 800 tons of 4 to 12-inch pipe for Seattle.

Structural Shapes . . .

Structural Shape Prices, Page 95

New York—Structural buying here has included little outstanding tonnage since the turn of the year, although inquiries continue to come out in fair volume. Leading fabricators generally have a substantial list of pending work before them, principally public work, and they look for expanding activity as the spring season approaches. Meanwhile, backlogs at most shops range from four to six months. Some of the smaller fabricating plants have less, although this appears to be due primarily to their selective policy in figuring new work.

Boston—American Bridge Co. has the contract for bridge superstructure, Housatonic river, Shelton-Derby, Conn., 4155 tons; girder spans will be welded. Connecticut also has contractor tenders on three bridges, two at Hartford, totalling 830 tons, steel for which will be placed shortly. Except for this activity, new work up for estimates is small and contracts slim. Plain material is parceled out sparingly, although one Boston district fabricating shop is now offering from stock welded steel trusses 30 to 120 feet, and steel joists, 30 to 70 feet for light construction.

Philadelphia—Structural buying is featured by two awards, involving modest tonnages for private account. New inquiry is light, but substantial tonnages are pending, mostly public work. Shapes are in slightly easier supply, although most fabricators still complain of difficulty in developing balanced inventories.

Chicago—Although larger fabricators generally have order backlogs far in excess of their immediate steel allotments, many are beginning to worry about the lack of new industrial business. Small fabricators are affected quite severely, with some saying they are almost current with their orders. There is no dearth of small jobs, however, and government bridge jobs dominate new inquiries and awards.

Birmingham—As has been the case over the past few months, most structural tonnage under estimate continues to be for public works. Aluminum is entering the picture in increasing measure in this district as are concrete blocks for small and semi-large construction.

Los Angeles—Supply and demand are closer to achieving day-to-day balance in structural materials than in any other category. With production substantially higher, while construction generally is off, structural materials are more plentiful than at any time in the past two years.

San Francisco — Although heavy building construction has lessened somewhat the need for structural products remains well under supply. The shortage is amplified by the fact that most of the western supply of structural shapes is manufactured in the East and shipments from that area continue restricted.

Seattle — Fabricators have substantial backlogs, but mills' allocations are below current requirements and some of the larger projects have to be by-passed. A large portion of current construction is public works

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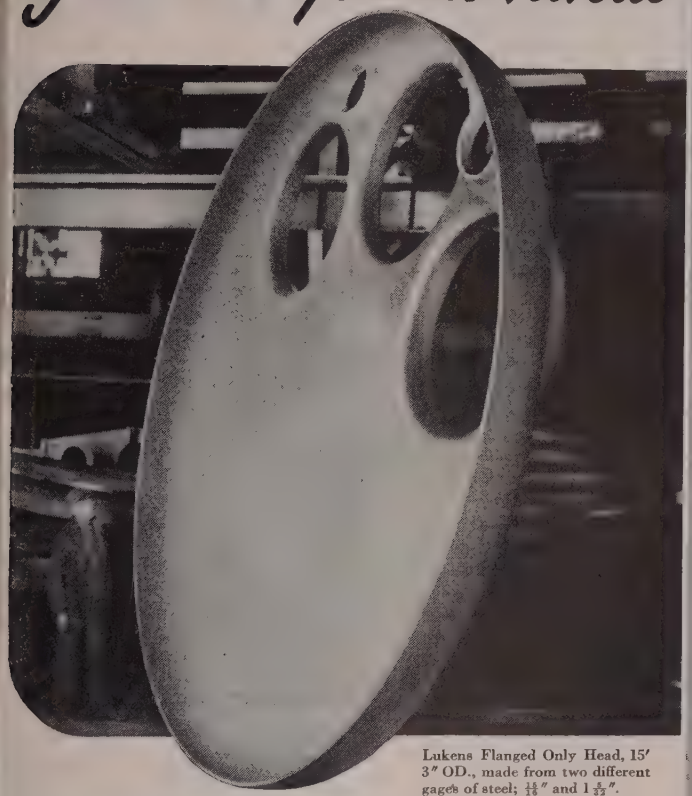
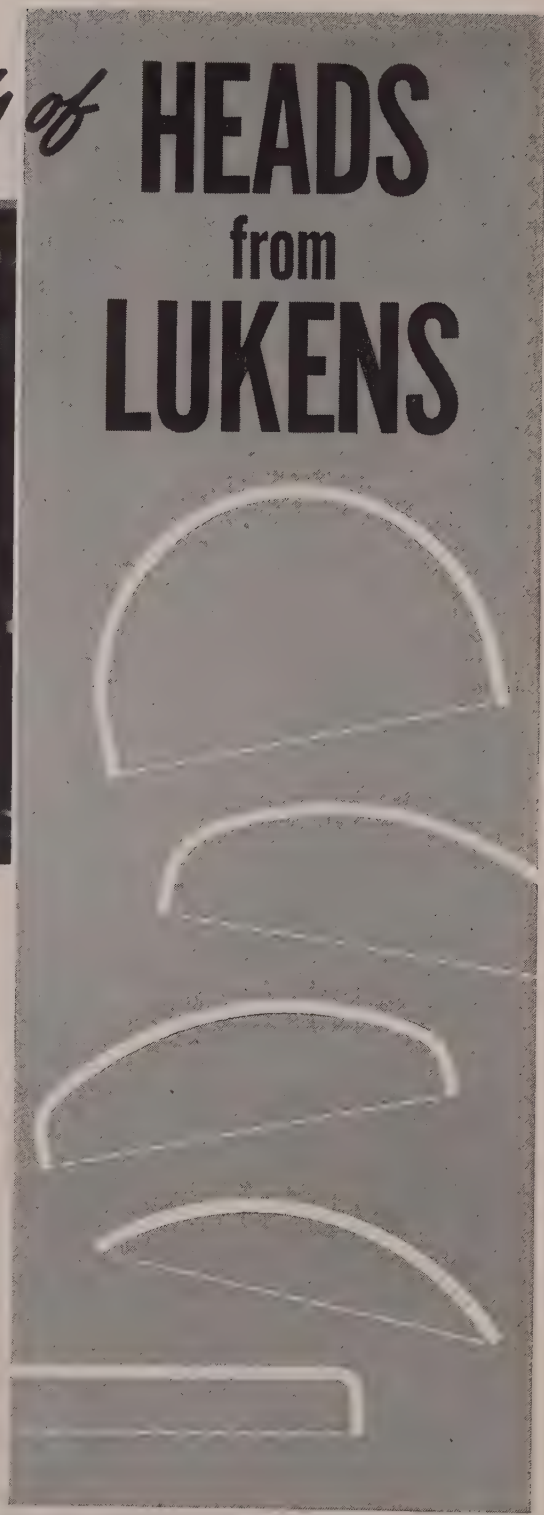


Lukens Flanged Only Head, 15′ 3″ OD., made from two different gages of steel; $\frac{11}{16}$″ and 1 $\frac{5}{32}$″.



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Steel Bars . . .

Bar Prices, Page 94

Inventorying accounts in part for slight easing noted in demand

Boston — Schedules are being aligned for second quarter, only through April in some cases, with revision more frequent in cold-finished than hot-rolled; yet there is no easing in demand for the latter from converters, hard put to meet commitments. Cutbacks in cold-drawn and alloys have been relatively more numerous with warehouses than with direct consumers and in most cases inventory correction, involving size and grade, is a factor. Smaller sizes continue to be most limited in supply. Pressure has eased from bolts and nut shops, although some size ranges are short; forge shop needs are more spotty. On the whole, textile equipment builders are taking in bar tonnage, but with some changes in specifications. Springfield armory closes Jan. 31 on 12,570 barrel blanks, forged.

Philadelphia—A leading producer of hot carbon bars has set up allotments on certified tonnage for April, with indications that no action will be taken on noncertified tonnage requirements for at least another couple of weeks. Outlook is for continued stringency in bars over the first half. Consumers of noncertified tonnage claim they are receiving less tonnage than in the fourth quarter of last year. Cold-drawn carbon bar shipments are falling short of requirements, especially in the small sizes. Cold drawers generally are well booked ahead for the next three months and are booking attractive orders for shipment beyond.

Chicago—Carbon bar quotas continue to be taken in full and pressure for increased tonnage is undiminished. Quotas were reduced by a number of mills and outlook for next quarter is for reinstatement of only a very little, if any, of this tonnage. In alloy bars and in semifinished the situation is easier, possibly a temporary condition arising out of the inventorying period and automotive, truck and farm equipment model revisions.

Tin Plate . . .

Tin Plate Prices, Page 95

Pittsburgh — Wheeling Steel Co. apparently is the only producer that to date has established a commodity price to cover all gages in which holloware enameling stock is sold, with price deductions or additions, depending on the gage, from the $5.30 per 100 pounds base for 29 gage. Some tin plate producers note some resistance among a few small customers to accept all "excess" tonnage offered; made up of overruns, bad coils, etc. However, important accounts continue to press mills for all tonnage available and producers state first-quarter schedules generally remain unchanged. Some mills expect a sizeable carryover tonnage to make up late this quarter and next, because of interruption in flow of strip coils resulting from speed-up programs on finishing mills. Second-quarter export quota of 113,000 tons was in line with industry's expectations, and compares with like amount in final period of last year.

Washington—Overall quota of 113,000 tons of priority rated tin plate for export in the second quarter will be distributed as follows: ECA countries, 43,870 tons; ECA territories, 7200 tons; Latin America, 27,280 tons; British Commonwealth, 20,410 tons; Far East, 5000 tons; Middle East, 7910 tons; Spain, 1000 tons; undistributed reserve, 330 tons. Of the quotas assigned to ECA countries, the largest include 11,000 to the Netherlands, 6000 to Norway, 3900 to Portugal, 3500 to Belgium-Luxemburg, 3350 to Switzerland, and 3000 tons each to Denmark, France, and Sweden; 2500 to Italy. Quotas amounting to 2250 tons or more were distributed as follows: French North Africa, 4200; Netherlands Indies, 1400; Brazil, 6000; Argentina, 5000; Cuba, 4100; Mexico 3750; Chile 2950; Australia, 10,500; Union of South Africa 7850; China, 2250; India, 3400.

Tin Plate Export Quotas Set

Washington—An export quota of 113,000 net tons of tin plate, to be shipped during the second quarter of 1949, has been established by the Office of Domestic Commerce of the Department of Commerce.

Approved foreign orders for tin plate, up to the 113,000-ton limit, will be supported by ratings (CXS) and must be accepted by tin mills, officials said. This tonnage is the minimum considered necessary to carry out foreign policy objectives, the department stated. Rated orders for tin plate are licensed only for use in preserving perishable foodstuffs.

Additional quantities of tin plate, up to 17,000 tons, may be licensed, but will not be rated, for export during the second quarter of this year. Of this total, 9500 tons may be licensed for packaging abroad of foods to be imported into the United States. The remaining 7500 tons may be licensed for uses permitted under conservation order M-43, including use abroad by American oil companies. Licenses for tin plate to be used for other than food preservation will be limited to electrolytic plate (maximum 0.50 lb coating) or special coated manufacturing ternes. Acceptance of licensed but unrated export orders is discretionary with tin mills.

Both rated and unrated export quotas for the second quarter of 1949 are the same as those for the first quarter.

H. B. McCoy, director, ODC said that while it is likely that the United States will receive somewhat larger allocations of pig tin during 1949 than heretofore, requirements of the nation's strategic stockpile will make impossible any increased allotments for industrial uses.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 94

Seattle — Demand for reinforcing bars continues steady, pressure for small tonnages being particularly strong. Mills are operating at capacity with backlogs still sizable. Large tonnages for Alaska military construction and the Columbia Basin project are immediately pending.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 95

New York—Bolts and nuts demand continues to ease in the heavier sizes, such as are required for structural steel, timber construction and ship work. Actually, deliveries on these sizes generally can be made promptly. In small sizes, however, such as are used principally in manufacturing assemblies, deliveries range on an average from six to eight weeks, there being little variation in this respect over the past month or so. Prices, meanwhile, are steady throughout the list. Foreign buying continues restricted because of lack of American dollars abroad. However, this picture may change quickly, depending upon requirements under the Marshall Plan.

Pittsburgh — Most fastener producers state steel shipments from mills continue to fall below immediate needs, making it impossible to operate machines on a full five-day per week schedule. Some easing in demand for fasteners is noted, however, notably for fabricated work. Order backlogs remain extended three to four months for small size classifications of popular items.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 96

New York—Reflecting the new surcharge of 6 per cent freight rates, foundry coke at Kearney, N. J. has been advanced 50 cents a ton to $22, ovens, effective as of Jan. 17.

Philadelphia — Oven foundry coke has been increased 50 cents a ton to $21 Swedeland, Pa., ovens, and to $21.05, Philadelphia ovens. These advances, effective as of Jan. 20, reflect the application of the 6 per cent freight surcharge earlier in the month.

Canada . . .

Montreal—Canadian Pacific Railway will convert 100 steam locomotives used in southern British Columbia and between Calgary and Edmonton from coal to oil burning, N. R. Crump, system vice-president, said.

Installation of wayside facilities for oil operation will be started immediately on the 862 miles of railway in the Kootenay and Kettle Valley divisions in southern British Columbia and along the Calgary-Edmonton run.

Alberta oil already is used on the main line from Calgary to Kamloops, with extension to the latter point from Revelstoke having been made in the past year, and consideration is now being given to its use right through to Vancouver. A further part of the trend to oil-burning power on the west coast is the dieselization now proceeding on the Esquimalt and Nanaimo Railway on Vancouver Island.

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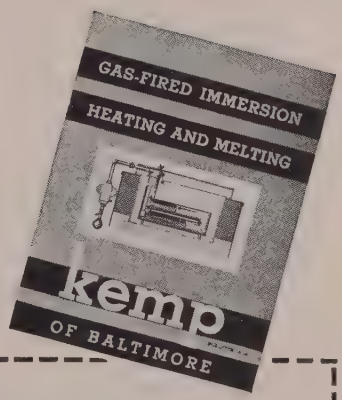

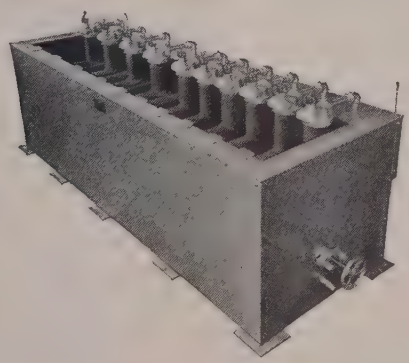

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Denies Major Cutbacks in Scrap Imports

Survey of major steel companies reveals no important cancellations of contracts for German scrap, says R. W. Wolcott, president of Lukens Steel. Cites heavy demand

New York — A survey of major steel companies show that no important cancellations of contracts for shipments of German scrap have occurred, Robert W. Wolcott, president, Lukens Steel Co., and chairman, Committee on Iron & Steel Scrap, American Iron & Steel Institute, said here last week.

In reply to recent statements and inferences, indicating that the need for scrap might be less urgent, Mr. Wolcott said the steel companies will need all the heavy melting scrap they can obtain, since production of steel is now at an all-time high which means that record-breaking tonnages of scrap are being used and will continue to be needed. Mr. Wolcott reaffirmed the hope that at least 1 million tons of scrap could be imported, principally from Germany, this year.

"Contrary to a published report that contracts covering 150,000 tons of material have been revoked, our survey of major steel companies indicates that not more than 25,000 tons have been canceled," said Mr. Wolcott. "One of these cancellations was necessitated by the fact that the quality of the scrap . . . . did not meet the specifications of the No. 1 heavy melting scrap ordered by the company. Another tonnage was canceled because the would-be buyer was unable to get any promise of date of delivery.

"The published statement was made that the total contract for German scrap aggregated 850,000 tons. To the best of my knowledge, confirmed by the Department of the Army, total allocations, including the second quarter of 1949, amount to only 715,000 tons. The joint Export and Import Administration in Germany awarded contracts considerably exceeding the actual allocation, this action being taken in the knowledge that many American entrepreneurs had contracts which they might never be able to complete and the joint administration expected it would be necessary, due to the inability of these brokers to fulfill their obligations, to make some cancellations. This, therefore, evidently accounts for the 'revocations' referred to."

One American consumer did cancel a contract covering about three or four cargoes for the reason that although the contract was placed in June, 1948, no shipments whatsoever had been made as of Dec. 31, 1948, he said. "The same consumer," Mr. Wolcott said, "has a number of other old contracts outstanding against which only token deliveries have been made, but in these instances no cancellation privilege has been exercised. The same consumer states that he is ready and willing to make further purchases at the present price provided he has reasonable assurance as to delivery and quality.

"Another published statement was made that a 'local dealer indicated that it would apparently be unnecessary to bring any Japanese scrap to the United States.' It would be interesting to learn just what knowledge this particular dealer may have of the national scrap picture, particularly on the West Coast where the situation promises shortly to become critical.

"No cancellations by steel companies are contemplated providing the scrap comes up to specifications and is received within promised delivery dates.

"The steel companies are in great need of heavy scrap which can be processed faster in steelmaking furnaces, thereby increasing total production . . . It is imperative that the quality of the scrap be maintained at a high level in conformity to established specifications."

Commenting on Mr. Wolcott's statements in the *New York Times,* an executive of the World Commerce Corp., New York, substantiated comments he had made earlier to the effect that contracts covering 150,000 tons of German scrap had been revoked. According to the *Times,* he pointed out that the cancellations to which he referred had been made by entrepreneurs who had received allocations from the Joint Export-Import agency in Germany. He made no reference, he added, to contract cancellations by consumers, such as steel mills. This official reiterated his statement that additional cancellations by scrap dealers might be expected unless consumers in this country were willing to meet the established price for the German material or unless the purchase price that must be paid to German collectors is lowered.

"If some price readjustment is not made," he is quoted as saying, "the collection machinery in Germany will break down."

Scrap . . .

Scrap Prices, Page 100

Pittsburgh—Leading consumers are showing no interest in contracting for new dealer scrap tonnage despite reported offerings at the $2 lower price level recently established on purchase by major interest. Considerable dealer scrap tonnage on old orders remains to be shipped this month and consequently producers are expected to play a waiting game on future price developments. Scrap inventories are largest since prewar in most instances and with prospect of further easing in quotations there is little incentive to re-enter market at this time.

With industrial open-hearth scrap grades under producer-customer agreements based on published prices, the price of No. 1 heavy melting steel industrial scrap currently is purchased on price range of $41 to $43. Dealers are finding it increasingly difficult to move No. 1 open-hearth grades as low phos quality material. In fact, low phos grades have weakened pricewise with present market estimated within range of $47 to $49.

The long standing price disparity between pig iron and cast scrap has been partially corrected in recent weeks and further drop in the latter prices is indicated. Foundries have been out of the market for some weeks now. Offerings of No. 1 cupola at $58 have been refused.

Award of No. 1 heavy melting railroad steel to mill at $44 was reported last week, indicating this scrap grade has not yet weakened. Railroad malleable, however, is reported off as much as $4.50. Railroad specialties recently were awarded to brokers in price range of $55.50 to $56.

Indicated further weakness in domestic scrap price levels is expected to prompt a review of foreign scrap contract price commitments when negotiations for new contracts are initiated. It is reported that some dealers have canceled foreign scrap commitments because of inability to move such scrap at the premium price differentials. Leading consumer continues to accept German scrap shipments involving about 200,000 tons under contract assumed last fall.

New York—Scrap brokers have dropped their buying prices on heavy breakable $8 to $40 a ton, f.o.b. shipping point, but have made no recent changes in other grades, including steel scrap. Consumer demand is fairly light, buyers as well as sellers moving cautiously.

Boston — In absence of trading, lower prices on both steel and foundry scrap are not subject to test, but consumers indicate they will resist any attempts to raise quotations back to formula. Buyers expect to pay no more than $55 for No. 1 cupola cast when buying is resumed. Some high-cost contracts for cast have been cancelled.

Philadelphia—Weakness still dominates the scrap market. While in the open-hearth grades there has been only one change, a slight revision to a flat price of $43 delivered, for No. 1 heavy, the general undertone is still soft and in low phos scrap and cast iron grades reductions have been general, and in some of the latter grades particularly sharp. Consumer buying generally continues light, with a result that some quotations are virtually nominal and are based in part on what some dealers are willing to sell for.

Buffalo—Weaker tendencies continue to pervade the scrap market as dealers are unable to find additional buying interest in No. 2 heavy melting and bundles at the reduced prices. Meanwhile, prices on No. 1 heavy melting extended their slide $1 to $2 a ton with new business placed within a range of $45 to $46 a ton.

Leading consumers remain on the sidelines and are making virtually no bids for large tonnages. Dealers do not appear unduly concerned over

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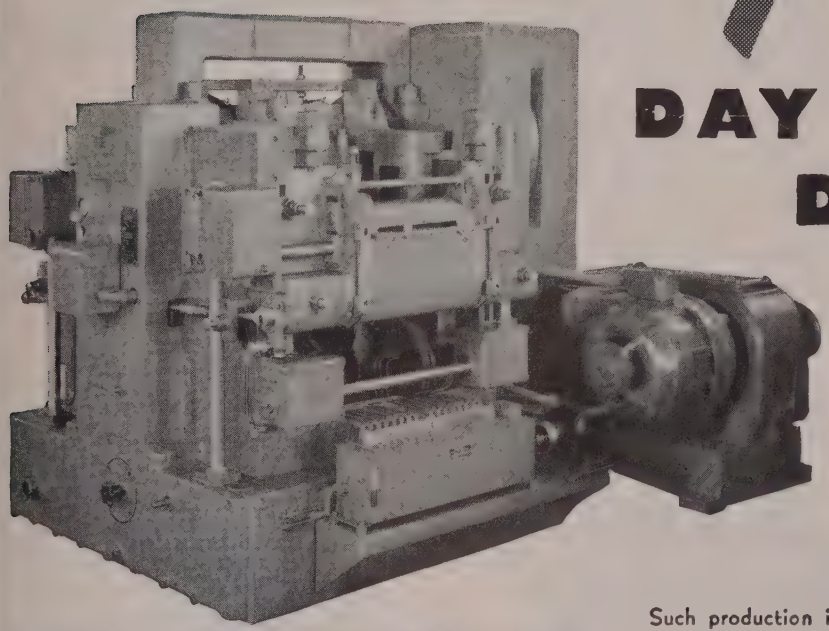

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the decline, since their yards stocks were at a low ebb when the price setback occurred. However, fairly substantial lots of scrap are being offered now.

Cleveland — Purchase by Portsmouth Steel Co. of 15,000 tons of No. 2 heavy melting steel and No. 2 bundles at $37.50 a ton delivered at Portsmouth, O., was reported last week.

That price is $2.50 a ton under the amount paid by the company two weeks ago for 10,000 tons of No. 2 material.

Most other mills have been remaining out of the market this month.

Sluggish demand for cast iron scrap is reflected in a drop of $1 in most of the grades, No. 1 cupola being quoted at $65.00-65.50.

Lowered production in some metalworking plants has reduced the flow of industrial scrap from them. As a result, one dealer here who regularly has been operating eight trucks to collect the material has cut the collection fleet to three or four trucks.

Republic Steel Corp., commenting on reports that contracts covering large tonnages of European scrap have been revoked by domestic dealers, issued a statement last week that it is anxious to receive the considerable tonnage of the material which it has ordered and has no intention of revoking any of the contracts.

Cincinnati—Prices of scrap, down $2 on open-hearth grades and $5 on cast, still are considered nominal in the absence of a test in tonnage buying. Tonnage is moving on old contracts, but few melters show interest in bolstering stocks which are already large.

Detroit—Prices are holding here on steelmaking grades, for one reason because mills are reticent over any downward adjustment in their formula prices applying to earmarked scrap. Rumors tell of discussions considering a $4 or $5 reduction in the formula, plus elimination of springboard payments. Position of the mills is understandable, since a cut in the price paid to customers for their scrap might bring immediate demands for a proportionate cut in steel prices. Ultimately the solution will have to be complete abandonment of earmarking and formula prices in scrap, allowing the market to return to its prewar supply-and-demand balance.

Chicago—Late last week a leading district mill reduced its buying price $2 for industrial scrap to $40 for No. 1 heavy melting. This reportedly was the only mill continuing to show interest in customers material. Previously, the company postponed for two weeks outstanding dealers' orders, thus moving delivery back into February. Indications are that no additional dealer scrap will be bought in that month by this interest. There have been no sales to local mills and while it is rumored that one out-of-town mill has sought tonnage here the deal is cloaked in secrecy.

Birmingham—While heavy melting is unchanged, price softening is evident in cast scrap items. Dealers and brokers report virtually no market

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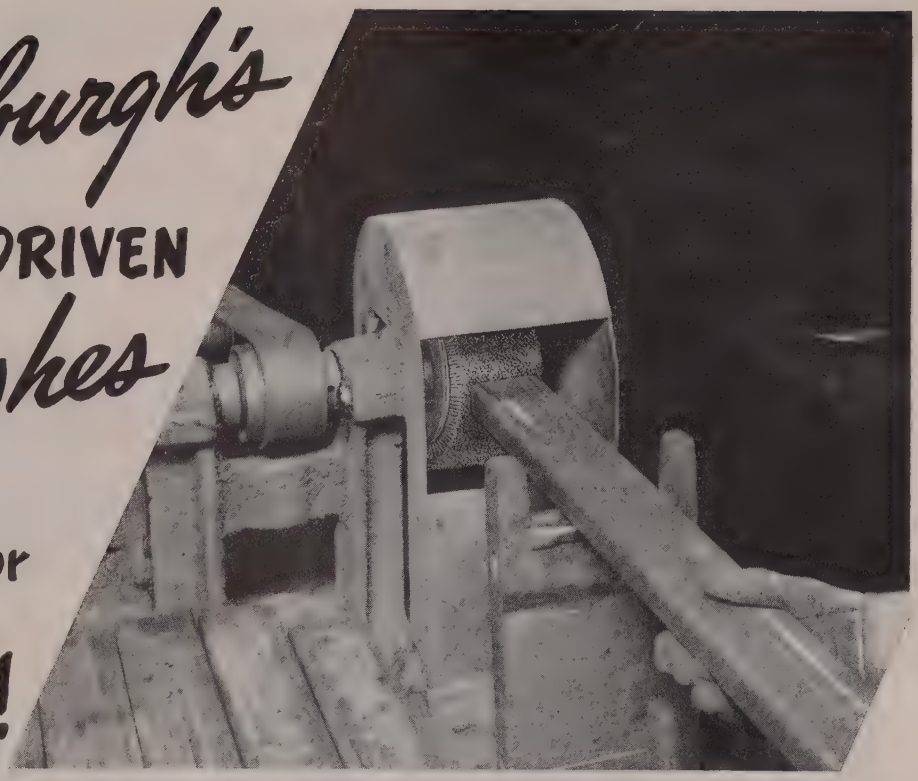

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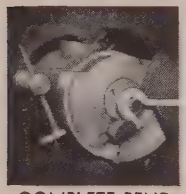
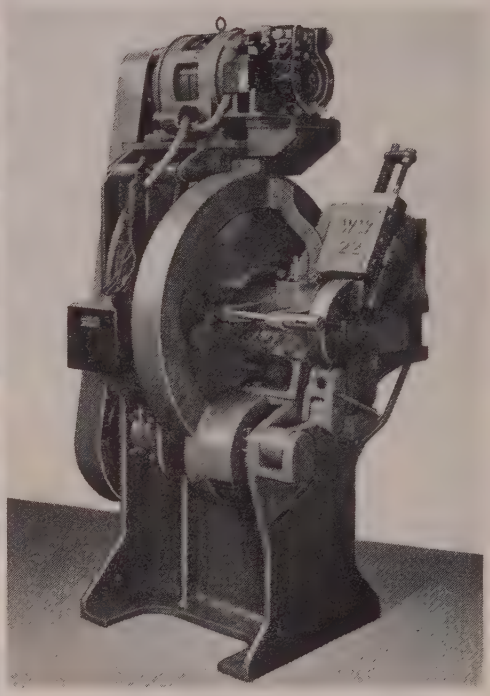


COMPLETE BEND

FINISHED EYE



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whatsoever for cast grades and say price quotations are purely nominal.

St. Louis—The scrap market here has experienced its first break since the first of the year with heavy melting steel down a minimum of $2 per ton. Offerings are being made on a "what'll-you-give" basis. With the exception of one mill's deal for a two-week supply at $39, no major transactions have been reported. Another says it has rejected melting steel at $35. Big melters intend to stay out of the market at least until the end of the month, some until Mar. 1. Most are intent on reducing 45 to 60 day inventories in anticipation of another price dip.

Cast scrap has dropped—with no takers—to indeterminate levels probably averaging $7 to $8 lower. One broker says No. 1 cupola cast has been offered at $50 to $52, down $13 from the level of December sales. Railroad scrap, which held up best of all grades to the year-end, is estimated to average $7 lower. One list recently went at $8 under the previous market.

San Francisco—Increasing supplies of steel scrap in eastern and midwestern industrial centers have improved the West Coast's scrap supply situation. Most western mills' scrap stockpiles at present are amply large, and Kaiser Co.'s Fontana mill now has the largest inventory in its history. All western steelmaking firms are having an easier time acquiring scrap than in several months.

One basic reason for this change is that the eastern mills are showing less tendency to buy scrap in the west and ship it to the east. As long as supplies continue plentiful and prices remain at present levels, this trend is likely to continue. Therefore, the western mills who depend on a greater proportion of scrap than do eastern furnaces, are likely to continue in a comfortable position.

One factor which could change this situation is a reduction in ship-scrapping operations. Three such projects still are under way, those conducted by Columbia Steel Co., Bethlehem and National Metal & Steel Co. Kaiser's ship-scrapping activity has been suspended.

The Martine Commision and Navy have stopped releasing ships for scrapping and, if this ban continues, the amount of scrap from this supply will be halted within several months.

Los Angeles — Scrap supplies in this area are still far from adequate, probably the major reason that prices for steelmaking grades are steadier here than in other districts. However, No. 1 cupola cast in recent weeks has toboggoned from a range of $50 to $55 down to a range of $37.50 to $42.50. The undertone continues weak, and with buying of foundry material limited, it is likely that sales are being made for less than posted quotations.

Seattle — Steel scrap is definitely easier, although mill buyers are still paying $29 to $30 per gross ton, f.o.b. mill. Reductions of 50 cents and $1 a ton applicable at a few out of town spots have been announced. From a mill staandpoint, the situation is the most favorable in the last three years during which buyers have been on a day-to-day basis.

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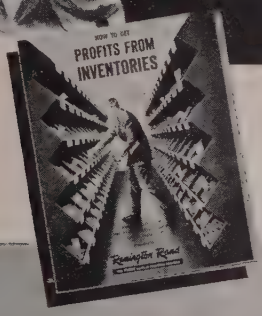

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Pig Iron . . .

Pig Iron Prices, Page 96

New York—While foundry melt in this district continues restricted, there is relatively little easing in pressure for pig iron which can be had without special premiums. Cast scrap prices have declined sharply, but are still holding at a substantial premium over pig iron. As a result, melters have every incentive for increasing the amount of pig iron in their melting ratio, especially in view of the fact that a heavier proportion of iron than they have been able to get in many months past would make for better castings and thus aid the competitive position of the producers.

As for premium iron, particularly foreign iron, demand has slowed to a virtual halt. So far as can be learned, there have been no important cancellations of foreign iron and this is probably due to the nature of the contracts; however, there is little interest in the placing of new orders.

Philadelphia—Pressure for pig iron continues strong, notwithstanding reduced foundry melt. Practically all foundries are endeavoring to increase the percentage of iron in their mix. Despite the further decline in cast scrap prices, pig iron is still substantially cheaper and, moreover, melters claim that the quality of the castings will improve with a return to a normal ratio of pig iron to scrap in their production.

Allied Iron Works blew in its blast furnace at Chester, Pa., Jan. 19. Daily production is expected to run around 200 tons. Later, when new blower equipment is installed, daily output is likely to average 400 tons.

Pittsburgh—Basic iron production here was increased last week with the resumption of output at Jones & Laughlin Steel Corp.'s No. 5 blast furnace at company's Pittsburgh Works. This unit was blown out Sept. 12 for complete relining and enlarging of the hearth from 20 to 24 feet, thereby raising rated capacity from 800 to 1000 tons.

American Steel & Wire Co. blew in its No. 1 blast furnace at its Donora Works Jan. 15. It had been out of production since Nov. 16.

Integrated steel producers anticipate that coal washing installations now under construction and on planning boards will substantially improve coal quality, thereby making possible greater pig iron yield from blast furnaces as result of better quality coke. Downward trend in new orders booked by gray iron jobbing foundries making light castings is one factor that has partially offset critical merchant pig iron supply.

Cleveland—Reduced demand for castings has caused foundries to become price-conscious in their purchase of pig iron. As a result they are shying away from premium-price iron from distant points and are placing almost sole dependence on standard-price material. Consequently, producers of the latter have experienced no let-up in overall demand and very few requests to delay shipments. Also keeping pig iron demand equal to or above capacity output are cast iron scrap prices that, despite recent declines, are still well above pig iron prices. As long as this spread exists, foundries will endeavor to push the percentage of iron in melts as high as possible.

Reflecting a decline in scrap prices to which its pig iron price is keyed, Republic Steel Corp. has reduced its Buffalo pig iron price 50 cents a ton, making basic and No. 2 foundry $47.50 and malleable $48.

Buffalo—Despite an increased number of cutbacks in foundry requirements, leading merchant iron sellers have no trouble in moving capacity production. The foundry situation appears uncertain, reflecting chiefly the mixed situation among caster users. Confusing the picture were increased shipments of iron from a leading Pennsylvania producer. Offsetting these shipments, however, was a sustained flow of automotive casters to Michigan sources.

Cincinnati—No slackening in demand for pig iron is noted, although the pressure for deliveries has diminished. The melt in small jobbing foundries and in some other directions, such as machine tool plants, is light, having failed to rebound.

Birmingham—Pig iron supplies, as measured in the light of overall needs, are scarcely any more plentiful, although slackened foundry operations have eased matters here and there. Cast iron pipe plants, nevertheless, continued to complain of the

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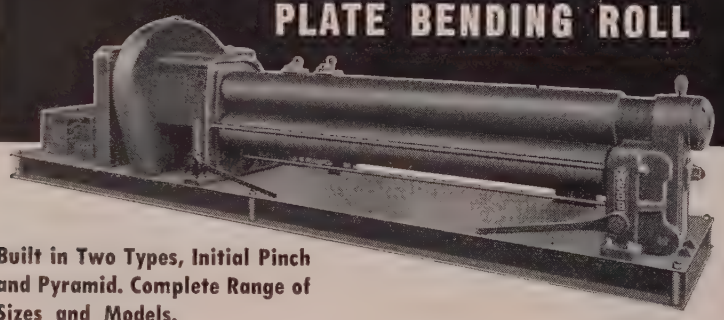

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shortage and resultant slackened production.

St. Louis—Pig iron stringencies continue to ease slightly, with occasional cancellations reported by local suppliers. Outside shipments are reported improving the availability of iron and Missouri-Illinois Furnaces Inc., which cut output 50 per cent during a 3-month repair job, has now been back in production long enough to make a substantial contribution to supplies. Most cancellations are from small foundries which have curtailed or suspended operations temporarily.

Warehouse . . .

Warehouse Prices, Page 97

Chicago—Warehouses are able to meet all their customers' requirements in only one product, stainless. Mill quota cuts for this quarter have resulted in some distributors getting only last year's carryover tonnage and selling must be limited on this basis. Heaviest demand is for heavy plates and other flat-rolled carbon products, and scattered manufacturing cutbacks have apparently made no dent in pressure for deliveries. Many of the consuming groups whose steel needs are lessening are mill and premium-priced material buyers rather than warehouse customers, so a tapering off from this direction is not being felt. Price adjustments as the result of freight rate increase continue to be made by individual warehouses. Stainless prices generally have been increased most since a substantial quantity of this material moves into the Midwest from eastern mils.

Pittsburgh—Increase in freight rates is not expected to significantly influence steel price structure among distributors here, because bulk of tonnage is purchased locally. No decision yet has been reached on this matter in respect to steel items purchased elsewhere, although some trade interests believe the freight boost will be absorbed on such tonnage. Steel distributors note little change in pattern of demand, with supply remaining well below stated customers' requirements. Inventory position productwise among most warehouse interests also has recorded little change. Mill shipping schedules for this quarter are somewhat better than the more pessimistic predicted.

Philadelphia—As the month advances some leading jobbers here assert that the dollar volume of business has not kept up with the December volume. On the principal carbon grades, such as sheets, strip, bars, shapes and plates, activity is being fairly sustained, but in some of the higher-priced specialties, including particularly stainless steel, volume has further declined.

Cincinnati—Jobbers have been unable to improve inventory position, with stocks unbalanced and inadequate to meet insistent demands. Cutbacks in some fabricating lines are not reflected in the apparent overall needs for warehouse steel.

Birmingham — Warehouse steel is still at a premium. Reports are that less steel is moving to warehouses this quarter than last and prospects are not particularly good for worthwhile improvement.

Los Angeles — Steel jobbers are

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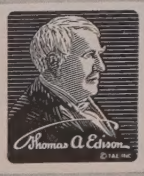

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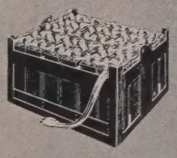

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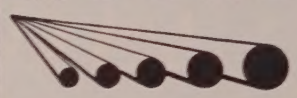
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seeking to fill out their badly out-of-balance inventories but are no longer taking everything they can get. Their buying and sales have tapered off for the time being, one warehouse reporting that the number of orders placed by its customers declined 25 per cent last week.

San Francisco — Need for nearly every major steel product continues to outrun supply. Some warehousemen say greatest pressure comes from large users and that demand from smaller fabricating concerns is slightly less active. The concentration of demand has made some jobbers wary of future business should general economic conditions show further retraction.

Seattle — Jobbing houses report larger inventories, and smaller turnover, giving them a chance to accumulate some tock items. Volume of business is the same as last month, which was considerably below October and November. Whether this change is due to seasonal conditions or an overall decline in business, warehousemen will not state. The smaller metal working shops have been adversely affected in recent weeks and the reaction is felt in jobbing circles here. The cessation of water transportation for 95 days and other conditions have contributed to the present situation. The price schedule is unchanged and the strongest demand continues to center on plates and sheets which are as critical as heretofore.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4155 tons, superstructure, Housatonic river bridge, Shelton-Derby, Conn., to American Bridge Co., Pittsburgh; girder spans to be welded, $1,728,354.40.

1000 tons, furnished by government, erection awarded to Leckenby Structural Steel Co., Seattle, for Coulee dam east switchyard.

600 tons, steel sheet piling, Army Engineer Corps, Bismarck, N. Dak., inv. 49, to Inland Steel Co., Chicago.

335 tons, industrial building, Franklin Park, Ill., for Brunner & Lay Co., Chicago, to Allied Structural Steel Cos., Chicago.

300 tons, warehouses and garages, to Leckenby Structural Steel Co., Seattle.

250 tons, galvanized transmission towers for Seattle light department, to Isaacson Iron Works, Seattle.

160 tons, continuous beam bridge, Granada, Colo., to Burkhardt Steel Co., Denver.

150 tons, power plant, University of Massachusetts, Amherst, Mass., to Haarmann Steel Co., Holyoke, Mass.

140 tons, bridge, 6525, Randolph, Minn., to American Bridge Co., Pittsburgh.

125 tons, bridge, Hendricks county, Indiana, to American Bridge Co., Pittsburgh, through George R. Harvey & Son, contractor.

100 tons, galvanized transmission towers for Tacoma light department, to Star Iron Works, Tacoma, Wash.

100 tons or more, steel bracing and deck framing, Bureau of Reclamation, Denver, spec. 2431, to Virginia Bridge Co., Denver, $199,700.

STRUCTURAL STEEL PENDING

9850 tons, Railroad Ave. viaduct, Seattle; bids probably in May.

800 tons, Hungry Horse dam spec. 2504 Coran, Mont.; bids in to Bureau of Reclamation, Denver.

750 tons, municipal sewerage disposal plant, Brooklyn, N. Y.; bids Jan. 25.

635 tons, two state bridges over New Have railroad, Springfield and Williman branches, Hartford, Conn.; Blakeslee C struction Co., New Haven, low on gene contract.

340 tons, grillages, extensions, etc., also stated tonnage for 253 galvanized s transmission towers; bids to Bonnev Power Administration, Portland, Ore Jan. 28; spec. No. 4464.

400 tons, power station, Laredo, Tex., Central Power & Light Co.; Sargent Lundy, Chicago, engineers.

366 tons, service and administration buildi Chicago Transit Authority; Joseph J. Du Co., Chicago, low on general contract.

200 tons, bridge, E. Peoria, Ill.; bids to U. Engineer, Chicago, Feb. 2.

195 tons, Corps of Engineers, Chicago distri bids Feb. 3, inv. 61.

145 tons, state bridge, Route 44, Still riv Winchester, Conn.; Charter Oak Constru tion Co., Hartford, low on general contra

130 tons, bridge, proj. S-0216(4), Sa county, Wis.; bids in.

125 tons, shapes and bars, bridge, Readin Woodstock, Vt. highway section; bids Ja 28, Montpelier.

REINFORCING BARS . . .

REINFORCING BARS PLACED

325 tons, substructure, Chelsea approa Mystic river bridge, Boston, to Trusc Steel Co., South Boston; Allied Engineeri Co., general contractor; Carnegie-Illin Steel Corp., 625 tons steel piling.

190 tons, state bridge Northport, Was to Bethlehem Pacific Coast Steel Cor Seattle.

185 tons, state bridge, Dorchester Ave., Sou Boston, Mass., to Bethlehem Steel C Bethlehem, Pa., and Northern Steel C Boston, Berke-Moore Inc., Boston, gene contractor.

175 tons, two bridges, Merrimack river, C cord, N. H., to Bethlehem Steel Co.

160 tons, addition to Catholic hospit Yakima, Wash., to Bethlehem Pacific Coa Steel Corp., Seattle.

125 tons, substructure for Clearwater riv bridge, Lawiston, Idaho, to Northwest St Rolling Mills Inc., Seattle.

100 tons, miscellaneous construction projec to Northwest Steel Rolling Mills In Seattle.

Western Fruit Express, 500 refrigerator ca to Pacific Car & Foundry Co., Seattle.

REINFORCING BARS PENDING

8850 tons, outlet work, Fort Randall servoir, near Lake Andes, S. Dak.; b Feb 2, Corps of Engineers, Omaha d trict. Work also takes 450 tons, structu Steel; 365 tons, miscellaneous metals; 3 tons, bulkhead and trashrack slot line 880 tons, bulkhead, gate and hoist ancho

3250 tons, Railroad Ave. viaduct, Seattle; b scheduled for May.

2500 tons, chief, Equipment and Procurem Division, Public Roads Administrati Washington; bids Jan. 28.

1100 tons, addition to Gorge powerhou Seattle Skagit river power project; pla approved, bids soon.

700 tons, municipal sewerage disposal pla Brooklyn, N. Y.

125 tons, pumping stations, Riverdale di Connecticut river flood control project, W Springfield, Mass.; bids Mar. 3, Corps Engineers, Boston district.

Unstated, 1200 foot concrete span, Portla Oreg., also state spans in Douglas a Sherman counties, Oregon; bids to Highw Commission Jan. 24-25.

Unstated, 226-foot underpass and highw bridge in Payette county, Idaho; Hansen Parr, Spokane, low for both, $168,813.

Unstated, store structure for Kress & C Bremerton, Wash.; W. G. Clark Co., Seat awarded general contract, $134,900.

Unstated, city hall and police station, Yaki Wash.; John H. Sellen Co., Yakima,

:704,220.

stated, Stuck river $83,000 span; bids oon to Pierce county commissioners, Tacoma, Wash.

LATES . . .

PLATES PLACED

5 tons, including shapes, furnished by government for caisson at Coulee dam; erection subcontract to Leckenby Structural Steel Co., Seattle.

0 tons or more, water tank for Grandview, Wash.; general contract to American Pipe & Construction Co., Portland, Oreg., low $74,862.

stated tonnage, 100,000-gallon elevated steel tank, Army Engineer Corps, Nashville, Tenn., to W. E. Caldwell Co., Louisville, Ky.

PLATES PENDING

5,000 tons, 30-inch, 1800-mile main gas line from McAllen, Tex., to New York, for Transcontinental Pipe Line Corp. In addition, substantial tonnage for about 400 miles of lateral lines. General contract awarded to Fish Engineering Corp., Houston, Tex.

5 tons, hull plate steel, Navy, Western yards and Washington, D. C.; bids in, Bureau of Supplies and Accounts, inv. 7760.

0 tons, penstock for addition to Gorge power plant, Skagit river project; plans approved, bids to Seattle soon.

stated, 60-inch corrugated metal pipe; bids to U. S. engineer, Portland, Oreg., Jan. 28.

stated, water system District No. 18, Alderwood Manor, Wash.; steel pipe low $390,-371; award pending.

IPE . . .

CAST IRON PIPE PENDING

5 tons, 8 and 12 inch cast iron, for Portland, Oreg., airport; bids in Jan. 25.

CONSTRUCTION AND ENTERPRISE

GEORGIA

TLANTA—Chrysler Motors Corp., Murphy Ave., is planning to build a $1 million plant addition; plans by Robert & Co. Assoc., 78 Poplar St.

TLANTA—Graybar Electric Co., c/o Henry Jordon, architect, Healey Bldg., has awarded a $365,000 contract to Gilbert Beers, 489 Bishop St. N.W., for construction of a warehouse and office.

TLANTA—Atlanta Paper Co., c/o Moscowitz, Willner & Millkey, architects, 1000 Peachtree St., N. E., has awarded a $1 million contract to Henry C. Beck Co., First National Bank Bldg., for erection of a paper products manufacturing plant.

LOUISIANA

ATON ROUGE, LA.—Ethyl Corp. has awarded a contract to C. F. Braun & Co., Alhambra, Calif., for engineering and construction work on proposed $10 million plant addition.

MARYLAND

ALTIMORE—Mack Realty Co., 1200-1204 W. Baltimore St., has awarded a $150,000 contract to Frantz Construction Co., 10 W. Chase St., for erection of a manufacturing building.

ALTIMORE—Baltimore Steel Co., 1400 Eastern Ave., fabricator of structural steel and ornamental iron work, has started erection of a branch plant on North Point Rd. One building is now under way with work on a second to be started immediately, and construction of other units expected to follow this year.

NEW JERSEY

OMS RIVER, N. J.—Jersey Central Power & Light Co., 100 Brook St., Long Branch, plans to build a $100,000 industrial building; J. L. Maxwell, c/o owner, engineer.

NORTH DAKOTA

MINOT, N. D.—Northern States Power Co., 15 S. Fifth St., Minneapolis, will build a $1 million power plant and transmission lines under the supervision of D. F. McElroy, superintendent.

RHODE ISLAND

CRANSTON, R. I.—Narragansett Brewing Co., Emil Schierholz, president, New Depot Ave., has awarded a $325,000 contract to Smiley Construction Co., 1115 Trenton St., Pawtucket, for erection of a storage unit including refrigerating facilities.

SOUTH CAROLINA

ABBEVILLE, S. C.—Abbeville Mills Corp. has awarded a $1 million contract to Daniel Construction Co., Greenville, for a mill addition.

COLUMBIA, S. C.—Hercules Tractor Corp., Auburn, O., is planning to construct a $250,000 tractor manufacturing plant; W. L. Brockway, c/o owner, engineer.

TENNESSEE

CHATTANOOGA, TENN.—Owner, c/o Hunt, Caton & Assoc., architects, James Bldg., is planning to spend $250,000 to remodel a structure for a warehouse.

COLUMBIA, TENN.—Monsanto Chemical Co., Columbia, has awarded a $750,000 contract to Rust Engineering Co., Clark Bldg., Pittsburgh, for construction of a smoke washing unit.

NASHVILLE, TENN.—East Tennessee Natural Gas Co. plans to build a $14 million natural gas pipeline from Centerville via Nashville, and intermediate towns to Chattanooga.

NASHVILLE, TENN. — Nashville Tennessean and Nashville Banner, 1100 Broadway, is planning to construct a $2 million plant addition; plans by Marr & Holman, Stahlman Bldg.

OAK RIDGE, TENN. — East Tennessee Natural Gas Co. plans a $10 million gas pipeline between Mitchellville and Oak Ridge.

TEXAS

DAINGERFIELD, TEX.—Lone Star Steel Co., Cotton Exchange Bldg., Dallas, plans to spend $450,000 for plant expansion for slag production.

DALLAS, TEX.—International Harvester Co., 1809 S. Lamar St., plans to build a $1,250,-000 warehouse or wholesale parts depot.

DALLAS, TEX.—General Motors Corp., United Motors Service Division, 515 N. Pearl St., has awarded a $445,000 contract to O'Rourke Construction Co., 1001 W. Commerce St.

DALLAS, TEX.—Westinghouse Electric Supply Co., 405 N. Griffin St., has awarded a $650,000 contract to E. V. McCright & Co. Ltd., 311 S. Akard St., for construction of a warehouse and office.

EASTLAND, TEX.—Kirk Pool Operators Commission plans to build a $1 million natural gasoline plant (flare gas).

FORT WORTH, TEX. — Community Public Service Co., Electric Bldg., is planning to spend $500,000 on electric power plant improvements and expansions.

GARLAND, TEX.—Kraft Food Corp., 2031 Amelia St., Dallas, is spending $240,000 to remodel, repair and convert the Continental Motors plant into a food making center.

HOUSTON, TEX.—American Can Co., Lockwood and Clinton Dr., plans a $375,000 addition to its metal can making plant.

HOUSTON, TEX. — HOM Co., 300 Wayside Dr., plans to construct a $1 million warehouse and office with air conditioning; plans by Harvin Moore, 2008 W. Alabama St.

HOUSTON, TEX.—Reichold Chemicals Inc., 601 Woodward Heights, Ferndale, Detroit, plans to construct a $500,000 resin plant and later a $1 million additional resin plant unit.

HOUSTON, TEX.—Produce Terminal Inc., c/o Vernon C. Vaughan, 101 Travis St., is plan-

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WRITE FOR MONTHLY TUBE STOCK BULLETIN

ning to construct a $2 million produce terminal; H. K. Ferguson Co., M & M Bldg., engineers.

HOUSTON, TEX.—Diamond Alkali Co., 1006 Main St., plans to spend $13,500,000 for chemical plant expansions, and $1,250,000 for a perchlorothylene chemical plant, both near LaPorte.

HOUSTON, TEX.—B. M. Vaughn & Co., 3227 Milan St., has awarded a $185,000 contract to Mecca Engineering & Construction Co., 2026 Harold St., for a warehouse and storage building.

HOUSTON, TEX.—J. Weingarten Inc., 808 Prairie St., is planning to build a $250,000 bakery, a $250,000 poultry processing plant, and a $200,000 warehouse; plans by Finger & Rustay, National Standard Bldg.

HOUSTON, TEX.—New Mexico Pipe Line Co., 702 San Jacinto St., has awarded a $312,000 contract to Wright Construction Co., Lovington, New Mexico, for a crude oil pipeline from Shafter Lake Station to southwest Andrews County.

HOUSTON, TEX.—Goodyear Synthetic Rubber Co., subsidiary, Goodyear Tire & Rubber Corp., LaPorte Rd., has awarded a $500,000 contract to Consolidated Western Contractors Inc., M & M Bldg., for expansion of its rubber plant.

PORT ARTHUR, TEX.—D. M. Picton Towing Co. plans to build marine repair shops and docks costing $500,000 east of Lakeview.

PORT ARTHUR, TEX.—Gulf Oil Corp., Port Arthur, plans to build a $4.5 million polyform refinery unit near here, and a $6 million desulphurization refinery unit.

RANKIN, TEX. — Plymouth Oil Co. has awarded a contract to Hudson Engineering Corp., Houston, for construction of a $5.5 million gasoline plant.

RANKIN, TEX.—Slick-Urschel Oil Co., Milam Bldg., San Antonio, has awarded a $6 million contract to Texas Natural Gasoline Corp., Milam Bldg., San Antonio, for the design and construction of a gasoline plant.

SAN ANTONIO, TEX.—Scobey Fireproof Storage Co., 315 N. Medina St., is planning to build a $250,000 warehouse and a $250,000 warehouse and industrial building; plans by Atlee B. & Robert M. Ayres, Transit Tower.

WICHITA FALLS, TEX.—Panhandle Producing & Refining Co., Panhandle Bldg., Wichita Falls, plans a $1 million enlargement of its refinery cracking plant here; Jones & Laughlin, 1504 Scott St., engineers, and Universal Oil Products Co., 310 S. Michigan St., Chicago, structural engineers.

UTAH

BONANZA, UTAH—American Gilsonite C will build a $250,000 gilsonite plant.

GARFIELD, UTAH—Kennecott Copper Corp Kearns Bldg., Salt Lake City, has award a $16 million contract to Utah Construction Co., 57 E. Fourth South St., Salt Lake City, for construction of an electrolytic co per refinery.

WASHINGTON

RUSTON, WASH.—American Smelting & R fining Co. is building a $300,000 building house a sulphuric acid plant.

VANCOUVER, WASH.—City is going to bui a treatment plant and pumping stations nanced by a $450,000 bond issue; plans Stevens & Koon, Portland.

WEST VIRGINIA

FOLLANSBEE, W. VA. — Follansbee Ste Corp., Third and Liberty Sts., plans construct a $100,000 factory and warehous W. L. Barr, c/o owner, engineer.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Continued from Page 97*)

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Aisifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c, per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. f.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed.. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 52%, Fe 8-12%, C 0.50% max.). Contra carload, lump, packed 20.25c per lb of all ton lot 21c, less ton 22.25c. Freight allow Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% ma Al 0.50% max., C 0.50% max.). Contra 100 lb or more. 1" x D, $1.20 per lb of loy. Less than 100 lb $1.30. Delivered. Sp add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 lb contained B, f.o.b. Philo, O., freight exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton carload, 8c per lb, f.o.b. Suspension Bri N. Y., freight allowed same as high-carb ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% ma Si 8% max., C 0.5% max.). Contract, ton 2" x D, $2.90 per lb of contained Cb, less $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6 Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0. 1.25%, C 3.50-5%). Carload, 12 M x D, c load packed 19.0c per lb of material, ton 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8 Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). C load, packed, 1" x D, 43c per lb of alloy, lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7 Fe 20% approx.). Contract, carload, pack ½" x 12 M, 16.5c per lb of alloy, ton 17.25c, less ton 18.5c. Delivered. Spot, 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 11%), C.l. packed, 16.50-17.00c per lb of all ton lots 17.90-18.00c; less ton lots 19.40-19.5 f.o.b. Niagara Falls, N. Y.; freight allowed St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19 Mn 8-11%). C.l. packed, 14.25c per lb alloy; ton lots 15.75c; less ton lots 17.0 f.o.b., Niagara Falls, N. Y.; freight allo to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Packed, lump, carload 11c, ton lots 11. smaller lots 11.75c per lb alloy; freight exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P c tent with unitage of $3 for each 1% o above or below the base): Gross tons per c load, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, c tained Mo, f.o.b. Langeloth and Washing Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, conta Mo, f.o.b. Langeloth, Pa., packed in bags c taining 20 lb of molybdenum, 95.00c.